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AN ANALYSIS OF SOCIO-MEDICAL INFLUENCES ON ECONOMIC BEHAVIOUR OF FARMERS IN A DEVELOPING COUNTRY

by

WILLIAM THEOPHILUS DE HANEY

A THESIS

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled AN ANALYSIS OF SOCIO-MEDICAL INFLUENCES ON ECONOMIC BEHAVIOUR OF FARMERS IN A DEVELOPING COUNTRY submitted by William T. DeHaney in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Sociology.

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ABSTRACT

AN ANALYSIS OF SOCIO-MEDICAL INFLUENCES ON ECONOMIC BEHAVIOUR OF PEASANT FARMERS IN A DEVELOPING COUNTRY

by

William Theophilus De Haney

This study attempted to identify the patterns of economic behaviour among two samples of peasant farmers and to test empirically a set of interrelated hypotheses concerning the correlates of those patterns. These objectives arose out of the general proposition which asserts that: physical labour is the basic input of the production process in the peasant sector of underdeveloped countries; where this is the case, the productivity of farmers and other agricultural workers is determined mainly by their health status.

A comparative research design was employed for measuring the relative effect of health status, selected value-attitudes, and economic variables on economic behaviour. Data were derived from the reports of 183 peasant farmers, selected by random sampling, from two rural communities in the western section of Jamaica. Three measures of the dependent variable, economic behaviour, were utilised: reported man-hours per year devoted to farming, number of farm practices adopted during the 18-month period covered by the study, and a derived score of labour productivity. Health status was operationally defined as, number of illnesses reported. Achievement motivation and attitudes toward farm innovations were measured by the respondents' total scores obtained from two different sets of scale items.

The following criteria were used for determining the relative effect of health status and other independent variables on the dependent variables. First, a set of zero-order rank correlation coefficients were computed for the measures of economic behaviour and each of the assumed independent variables. Secondly, partial rank-order correlation coefficients were calculated for the dependent variables and each independent variable, controlling for achievement motivation, perceived demand for farm products, and other variables specified in the hypotheses. The relative magnitudes of these correlations provide the final criterion for deciding on the relative effect of the various independent variables.

The data indicate that the typical full-time small farmer in the less exposed community devotes to productive farming less than one-half of the maximum labour time possible; earns less than J$100.00 per year from the sale of farm crops; and does not adopt any of the farm practices recommended by agricultural agencies. In the more exposed community the typical full-time small farmer devotes to productive farming 119 man-hours per year, or two-thirds of maximum amount of time possible, earns less than J$200.00 per year from the sale of farm crops; and like his counterpart in the other community does not adopt any of the farm practices recommended by agricultural agencies. The data also indicate that, in both communities, the typical peasant farmer operates a holding of less than 1 acre; owns none of the land he cultivates; and that the farmer's labour input is the main component of the production function.

On the basis of the relative magnitudes of the empirical correlations computed for the different dimensions of economic behaviour and each of the

assumed independent variables, perceived demand for farm products appears to be the best predictor of labour productivity in each of the two communities. The number of farm practices adopted is next in relative importance. Labour input, attitudes toward, and the practice of, farm innovations were found to be significantly related to the farmers' health status. On the whole, the findings suggest that social structural and health factors exercise more influence on the economic behaviour of the populations sampled than psychological variables such as, achievement motivation and a preference for leisure at the expense of hard work.

ACKNOWLEDGEMENTS

Several persons have contributed either directly or indirectly to the completion of this thesis. Although the names of most of them can not be mentioned here, I gratefully acknowledge my indebtedness to them all.

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CHAPTER I

THE PROBLEM

Introduction

In much of the literature dealing with economic underdevelopment,[1] there is a widely held set of assumptions concerning the nature of economic behaviour among people in the underdeveloped parts of the world. According to Theodore Malthus,[2] economic behaviour among peasant farmers in Latin American countries is characterized by ignorance, indolence, and lack of incentive for hard work. Similarly, T.H. Simey[3] asserts, with respect to Jamaican peasant farmers, that their patterns of work and performance are characterized by what economists term 'backward-sloping curves of effort and risk-taking'. In other words, increased wages and high prices induce the worker to work fewer hours so that he can enjoy more leisure. And Colonial observers like J.H. Boeke[4] claim that

---

[1] The term is often used to refer to countries whose per capita real income is low when compared with the per capita real income of the United States of America, Canada, Australia, and Western Europe. But that usage ignores the fact that, even in those countries, per capita incomes vary from one region to another, and that per capita income might be low in one region relative to the others.

[2] Theodore Malthus, Principles of Political Economy, Book II cited in Benjamin Higgins, Economic Development, (London, Constable, 1959) pp. 105-106.

[3] T.H. Simey, Welfare Planning in the West Indies (London: Clarendon Press, 1946), pp. 133-134.

[4] J.H. Boeke, Economics and Economic Policy of Dual Societies (New York: Institute of Pacific Relations, 1953); Benjamin Higgins, Economic Development: Principles, Problems, and Policies, 1959) (London: Constable and Co. Ltd.), pp. 275-97.

those patterns of economic behaviour are traceable to limited wants. Not only are wants limited, but they are social rather than economic. That is to say, people are more interested in prestige, affiliation, and consumption than profit-making and excellence in performance.

There are, however, other writers and observers who question the 'lazy syndrome - limited wants' explanation of economic behaviour among farmers and other categories of workers in underdeveloped regions. Arthur Lewis,[5] and others, deny that limited wants are typical of peasant farmers throughout underdeveloped countries. On the contrary, farmers in the African country of Ghana are quick to seize opportunities to use better seeds, or fertilizers, and to plant more profitable crops, providing they perceive the demand for such crops. But expectation of material rewards is only one of the variables that may be related to economic behaviour. In fact, many of the recent studies[6] of economic behaviour among peasant farmers frequently make reference to a set of factors termed 'human resources': all improvement to productivity not attributed to the classical factors of production.

The factor of health, for example, is frequently cited as an important

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[5]Arthur Lewis, The Theory of Economic Growth (London: George Allen and Unwin Ltd., 1955), pp. 39-41; P.T. Bauer and B.S. Yamey, The Economics of Underdeveloped Countries (London: James Nisbet and Co. Ltd., 1957) pp. 86-93.

[6]John Bryant, Health and the Developing World (Ithaca: Cornell University Press, 1969), pp. 95-125; Gunnar Myrdal, An Approach to the Asian Drama: Methodological and Theoretical (New York: Vintage Books, 1970), pp. 645-63.

determinant of productivity;[7] but like the other statements about limited wants, low achievement motivation, and the like, the relative importance of health status is rarely subjected to direct analysis.[8] In this study we have taken the view that, where the major economic activity is labour-intensive (as is the case of most of the farming in underdeveloped countries) the behaviour related to productivity is a function of the level of health of the workers.

Statement of the Problem

This study was designed to achieve two objectives. Firstly, it attempted to determine the patterns and correlates of economic behaviour among peasant farmers in two Jamaican communities. Secondly, an attempt was made to assess the relative effect of individual patterns of health on labour productivity.

For purposes of the study the terms "economic behaviour" and "economic activity" are used interchangeably to refer to those activities devoted to earning a livelihood. Thus, in the study of farmers' economic behaviour the following variables will be considered: amount of time devoted to farming, the use of new information and techniques in farming, types of farming activities, and the extent to which farmers deliberately produce for the market.

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[7] George M. Leiby, "A Community Health Challenge - Northeast Brazil," American Journal of Public Health, 54, (August 1964), p. 1207.

[8] Notable exceptions which treat health status as a determinant of individual behaviour are, Gordon F. Streib, "Morale of the Retired," Social Problems, 3, (1956), pp. 270-76; P.S. Lawrence, "Chronic Illness and Socio-Economic Status," in E.G. Jaco (ed.) Patients, Physicians and Illness: Sourcebook in Behavioral Sciences and Medicine (New York: The Free Press, 1958), pp. 37-49, Ronald M. Anderson and Robert L. Eichhorn, "Correlates of Labor Efficiency Among Older Farmers in Poor Health," Rural Sociology, 29, (1964), pp. 181-193.

The correlates of economic behaviour chosen for this study fall into two categories. Included in the first category are attitudes toward work, orientations toward new ideas and techniques or innovativeness, expectations and aspirations concerning level of living, and belief in long-range planning. All of these variables have been cited in the literature dealing with economic conditions in underdeveloped countries. But as Rogers[9] points out, statements about the nature and effect of social-psychological variables have not progressed beyond the level of commonsense.

Physical health is the second category of variables assumed to be related to economic behaviour. Its importance as a determinant of the individual's psychological attributes and of his behaviour has long been assumed by social scientists[10] and policy-makers.[11] However, empirical attempts at determining the behavioural consequences of health are extremely rare. One of the major objectives of this study was to determine empirically the influence of individual patterns of health on the economic behaviour of selected groups of peasant farmers.

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[9] Everett M. Rogers, Modernization Among Peasants: The Impact of Communication (New York: Holt, Rinehart and Winston, Inc., 1969) p. 243.

[10] Earl L. Koos, Family in Trouble (New York: King's Crown Press, 1946); Gordon F. Streib, "Morale of the Retired," Social Problems, 3, (1956), pp. 270-76; C.E. Winslow, The Cost of Sickness and the Price of Health (World Health Organization: Monograph Series No. 7, 1951.

[11] John W. Morse, "Demography, Feedback, and Decision-making for Economic and Social Developments," Milbank Memorial Fund Quarterly, No. 2, 42, (April 1964), pp. 301-27.

Definition of Terms

Health: Although health occupies a central position in the study, it is one of the most difficult concepts to define in operational terms. Theoretically, health may be defined as "a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity."[12] There is, however, no agreement as to what constitutes mental and social well-being. Therefore, despite the limitations of the negative approach which focuses on the absence of disease and disability, this study adopted the medical symptoms approach and defined health status as the number of positive symptoms reported by the respondents in the study.

Labour productivity refers to the total cash crop output or the value of cash crop per unit of land of the farmer's holding divided by the number of man-hours invested in the production of that output.

Supply of labour or working capacity is defined as the total number of hours devoted to work, e.g., farm work. It is calculated from the number of days per week multiplied by the number of hours per day devoted to farming.

Peasant farmers: The term, often used as a synonym for "subsistence farmers," refers to small scale agricultural producers who consume the bulk of their products. Some descriptions of peasant farmers claim that their technology and equipment are simple, and that the land under their control is used primarily as a means of livelihood, and not as a business aimed at making

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[12] World Health Organization, Official Records, No. 2 (June 1948), p. 100. Quoted by John Kosa in John Kosa et. al. (eds.) Poverty and Health (Cambridge, Mass.: Harvard University Press, 1969), p. 36.

profit.[13] In this study, the term peasant farmer will denote an individual who devotes most of his working time to agricultural production, and whose holding is less than 6 acres of land. Both subsistence and market-oriented small farmers are covered by the term.

Organization of the Thesis

The remainder of the thesis is presented in five chapters. Chapter II discusses some of the literature concerned with the antecedents of economic productivity and presents a theoretical framework specifying the variables to be investigated and the rationale for their selection. Chapter III describes the locale of the study and the research methodology utilized to generate data for testing the hypotheses. The following chapter presents and discusses the descriptive findings on the socio-medical characteristics, farm practices, and level of productivity among the farmers studied. Chapter V examines the statistical correlations between various indicators of productivity and other aspects of economic behaviour on the one hand, and on the other hand, the interrelationship between economic behaviour and health status. The final chapter summarizes the findings and discusses their theoretical implications, as well as practical implications for policies and programmes aimed at increasing

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[13] Eric R. Wolf, "Types of Latin American Peasantry: A Preliminary Discussion," American Anthropologist, 57, (1955), pp. 452-71; Raymond Firth, Elements of Social Organization (London: Watts, 1956), p. 87; Clifton R. Wharton, "Subsistence Agriculture: Concepts and Scope," in Clifton R. Wharton (ed.) Subsistence Agriculture and Economic Development (Chicago: Aldine Publishing Co., 1970) pp. 12-20.

productivity among peasant farmers in circumstances similar to those studied. This chapter also raises a number of methodological issues concerning the adequacy of current techniques employed in the measurement of social psychological variables, such as achievement motivation.

The appendices to the thesis provide detailed information on the data-collecting instruments. Additional information on the socio-demographic and other characteristics of the population are included.

CHAPTER II

BACKGROUND THEORY AND RESEARCH

Review of Literature

The theoretical perspective which guides this study is derived from studies and discussions concerning the dynamics of economic development in peasant and subsistence economies. Traditionally, theories of economic development have been formulated around the concept of capital/output ratio.[1] According to this view, the total output of goods and services for each sector of the economy or for a national economy as a whole, depends upon the supply of natural resources, e.g., land minerals, the stock of capital goods, and the size of the labour force. However, as soon as economists attempt to translate the concept into an operational model they tend to single out capital as the strategic determinant of output. Thus, it is estimated that 4 units of capital are required in order to increase output by 1 unit. This means that an investment of $100 is likely to yield a marginal value output of $25.[2]

The emerging view stresses the importance of human beings as necessary factors of production and argues that, in order to raise the level of economic

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[1] Benjamin Higgins, Economic Development: Principles, Problems, and Policies (London: Constable & Co. Limited, 1959), p. 87.

[2] Arthur Lewis, The Theory of Economic Growth (London: George Allen and Unwin Ltd., 1955) pp. 225-26, Gunnar Myrdal, An Approach to the Asian Drama: Selections from Asian Drama - An Inquiry into the Poverty of Nations (New York: Vintage Books, 1970), p. 309.

activity it is necessary to understand the characteristics which influence the individual's working capacity and other aspects of economic behaviour. And in reference to the peasant sectors of an economy, it is argued that change in those sectors depends upon the transformation of the personal characteristics of peasant farmers.[3] While proponents of the current view present somewhat different lists of individual-related factors which intervene in the production process, they all agree on the important role of non-economic variables. Furthermore, an increasing number of economists and other social scientists[4] now take the position that non-economic variables are not only important, but that under certain conditions, e.g., in labour-intensive production, they are crucial factors in the development process.

The non-economic factors most often cited as conditions for a dynamic increase in agricultural productivity, at the village level, may be classified into three categories. The first of these includes a set of institutional factors,

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[3]Clifton R. Wharton, Jr., "Risk, Uncertainty and the Subsistence Farmer: Technological Innovation and Resistance to Change in the Context of Survival," Chicago, Illinois: Joint Session of American Economic Association and Association for Comparative Economics, (Chicago, Illinois, 1968), p. 1, William McCord The Springtime of Freedom: Evolution of Developing Societies (New York: Oxford University Press, 1965), pp. 122-147.

[4]Leon Dupriez (ed.) Economic Progress: Papers and Proceedings (Louvain: International Economic Association, 1955); Bert Hoselitz, "Tradition and Economic Growth," in R. Braibanti and J.J. Spengler (eds.) Tradition, Values and Economic Development (Duke University Press, 1961) pp. 83-113; United Nations Report on World Social Situation (New York: United Nations Department of Social and Economic Affairs, 1961) pp. 31-66.

such as: land tenure system, family structure, and the pattern of organizing activities in general, and economic activities in particular.

Land tenure system means 'all the relationships established among men regarding their varying rights in the control and use of land'.[5] Most systems may be classified as tribal, feudal, rental, owner-operator, cooperative or nationalized.[6] Studies concerned with agricultural production indicate that, where land is concentrated in the hands of a few large proprietors, the system exercises a negative effect on farm practices. The tenancy system in particular, is said to 'erode the initiative of those who actually perform farm work'[7] and causes farmers to 'act in short-term rather than long-term perspective'.[8] In other words, land tenure system may work against achievement motivation, individual supply of labour, and consequently increased productivity.

Another institutional factor which is assumed to exercise a negative effect on achievement motivation and economic behaviour is the family system.

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[5]Howard W. Beers, "Socio-Economic Development and Man-Land Relationships," Sociologia Ruralis, 8, No. 3-4, (1968), p. 337.

[6]Ibid.

[7]Gunnar Myrdal, An Approach to the Asian Drama: Methodological and Theoretical (New York: Vintage Books, 1970), p. 1092.

[8]Howard Beers, op.cit., pp. 330-58.

In subsistence economies, the system is familistic in the sense that individual goals are subordinate to those of the family. Lewis and others[9] claim that the relatively low innovativeness of peasant farmers as well as the low level of productivity can be attributed to the effect of familism. Since any increase in productivity that might arise from greater individual effort would have to be shared among his relatives, the subsistence farmer is not likely to commit his full labour potential to farm work or other economic activity.

While the empirical evidence concerning the relationship between adoption of farm practices and familism is not consistent, there is some support for the claim. Fliegel,[10] for example found the two variables to be inversely related, both before and after controlling for factors such as: size of farm, level of living, and attitudes toward farm practices. In other words, the study indicated that familism is not conducive to innovativeness among farmers. On the other hand, Bose,[11] in a study of Indian peasant farmers, found no significant relationship between the adoption of farm practices and familism. A

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[9]Oscar Lewis, Tepozlan: Village in Mexico (New York: Holt, Rinehart and Winston, 1960) pp. 54-88; Everett M. Rogers, "Motivations, Values, and Attitudes of Subsistence Farmers: Toward a Subculture of Peasantry," in Clifton R. Wharton, Jr., (ed.) Subsistence Agriculture and Economic Development (Chicago: Aldine Publishing Co., 1970) pp. 122-23.

[10]F.C. Fliegel, "A Multiple Correlation Analysis of Factors Associated with Adoption of Farm Practices," Rural Sociology, 21, No. 3-4, (1956), pp. 284-92.

[11]S.P. Bose, "Peasant Values and Innovation in India," American Journal of Sociology, 67, No. 5, (1962), pp. 552-60.

possible reason for the discrepancy in the findings of the two studies might be the fact that the operational measures of familism and adoption of farm practices were different.

Social psychological variables are the second set of conditions that receive the attention of current theories of peasant economies. Variables such as worker motivation, attitudes toward work, and value orientations, are often used to explain the economic behaviour of different categories of workers. Max Weber,[12] one of the earlier proponents of this view, postulated that modern or mature capitalism is a function of the distribution of a certain personality type throughout the society. The characteristics of this type are, according to Weber, belief in the vaue of work, individualism, thrift, and rationality.[13] More recently, other theorists have pursued this line of thinking and research. McClelland,[14] for example, asserts that achievement motivation[15] is the major determinant of variations in patterns of economic behaviour among occupational categories within an economy. And at the empirical level of

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[12]Max Weber, The Protestant Ethic and the Spirit of Capitalism (New York: Scribner and Sons, 1958).

[13]Ibid., pp. 155-183.

[14]David C. McClelland, The Achieving Society (New York: The Free Press, 1967); "The Achievement Motive in Economic Growth," in David E. Novack and Robert Lehachman (eds.) Development and Society: The Dynamics of Economic Change (New York: St. Martin's Press, 1964).

[15]According to McClelland's definition, achievement motivation "is the desire to do well not so much for the sake of social recognition or prestige, but to attain an inner feeling of personal accomplishment." (The Achieving Society, p. 76).

investigation, he demonstrated that differences between the economic success of selected social groups were related to the set of attitudes which characterize economic rationality and achievement motivation.[16]

Supporters of the social psychological thesis of economic behaviour and development believe that their thesis can explain the level of productivity in underdeveloped countries. Although very few systematic studies have been done in those countries, the inference is made that the number of individuals with high achievement motive is in short supply. Furthermore, those who hold this view argue that dynamic economic development will not result from policies which seek to change the social system. Instead, they recommend that the policies be directed toward changing the values and motives of individuals -- the preconditions of economic development.

Hagen, one of the foremost supporters of the "people-transformation hypothesis," is somewhat vague in his recommendation.[17] He suggests, for example, that the transformation can take place by way of the intrusion of outside forces, or by creating tensions among an existing elite. It is not clear, however, how these processes can be initiated. On the other hand, McClelland recommends the launching of ideological campaigns, the emancipation of women, and early character training. The last of these processes "is by all

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[16] Ibid., pp. 259-276.

[17] Everett E. Hagen, "The Theory of Economic Development," in Economic Development and Cultural Change, (April 1957); On The Theory of Social Change (Homewood: Dorsey Press, 1962), pp. 217-36.

odds the one most likely to succeed"[18] in changing the values and motive of individuals.

Although the psychological model of behaviour, and by extension, of economic behaviour, is widely supported by social scientists, its merit as a scientific theory has not been demonstrated. As one of its proponents admitted, there is as yet no objective procedure for validating the model. According to Hagen:

> ---sequences of personality change must be speculative, or to use the term loosely, intuitive. Sequences of action and reaction within individuals are difficult to analyze, at least with the tools yet devised by social scientists. In the main, the analysis must be by introspective examination and rearrangement of elements of behaviour within oneself until one feels that one has arrived at a sequence that accounts for certain outer manifestations in other individuals.[19]

Furthermore, if one regards the practical effectiveness of a theory as its principal justification--as some social scientists assert[20]--theories of behaviour which assign a causal status to motives and attitudes have little practical value. For as their proponents claim, those internal states, once formed, are

---

[18]David C. McClelland, "Community Development and the Nature of Human Motivation," (Paper presented to the Conference on Community Development and National Change, M.I.T., December 1957, pp. 8-9); also cited in Benjamin Higgins, op. cit., p. 301.

[19]Hagen, On the Theory of Social Change, op. cit., p. 201.

[20]Emile Durkheim, The Rules of Sociological Method (New York: The Free Press, 1964) Talcott Parsons, The Structure of Social Action (New York: McGraw-Hill, 1937), p. 301, Alvin W. Gouldner, "Theoretical Requirements of the Applied Social Sciences," American Sociological Review, 22, (1957), pp. 92-102.

difficult if not impossible to change. Social planners and administrators who seek to effect rapid social change need theories whose independent variables are accessible to control.[21] Those formulated by the McClelland and Hagen school do not satisfy that criterion. Indeed, according to Kunkel and other critics, they condemn "presently underdeveloped nations to poverty and stagnation for at least the next few generations."[22]

The third and final set of noneconomic factors which enters theoretical models of economic development and modernization is, human resources or human capital. This concept is vaguely defined as all improvement to productivity not attributed to the classical factors of production.[23] As inputs of the production function, human capital includes knowledge of productive techniques,[24] the health status of those who participate in the production

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[21] Gouldner, ibid., p. 96.

[22] John H. Kunkel, "Some Behavioral Aspects of Social Change and Economic Development," in Robert L. Burgess and Don Bushell, Jr., (eds.), Behavioural Sociology: The Experimental Analysis of Social Process (New York and London: Columbia University Press, 1969), p. 339.

[23] Vincente Navarro, "Systems Analysis in the Health Field," Socio-Economic Planning Science, 3, (1969), pp. 179-189.

[24] Wilbert E. Moore, The Impact of Industry (Englewood Cliffs, New Jersey: Prentice-Hall, 1965), pp. 4-6; "The Social Aspects of Economic Development," in R.E.L. Faris (ed.), Handbook of Modern Sociology (Chicago: Rand McNally and Co., 1964) pp. 882-911.

process,[25] and formal education.[26]

Education and literacy as necessary factors of economic development have received a great deal of attention both in theoretical formulations and in empirical research. The acquisition of education and skills or knowledge of productive techniques, according to Moore,[27] furthers the development of ambition for personal betterment. Some writers[28] go so far as to advocate that expenditure on formal education, at the elementary level, should have priority over all other types of expenditure, if agricultural practices, productivity among farmers, and individual modernization, are to take place. "Literacy," according to Daniel Lerner, "is indeed the basic personal skill that underlies the whole modernizing sequence. . ."[29] In other words, education and

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[25]Theodore W. Schultz, "Investment in Human Capital," American Economic Review, 37, (1961); Selman J. Mushkin, "Toward a Definition of Health Economics," Public Health Reports, 73, (September 1958) pp. 785-93; H. Correa, The Economics of Human Resources (Amsterdam: North-Holland Publishing Co., 1966).

[26]Ibid.

[27]Wilbert E. Moore, Social Change (Englewood Cliffs, New Jersey: Prentice-Hall, 1963), p. 96.

[28]Arthur T. Mosher, "Research on Rural Problems," in The Brookings Institution, Development of the Emerging Countries: An Agenda for Research (Washington, D.C.: The Brookings Institution, 1968), pp. 71-119.

[29]Daniel Lerner, "Toward a Communication Theory of Modernization," in Lucien W. Pye (ed.) Communications and Political Development (Princeton, N.J.: Princeton University Press, 1963), p. 341.

literacy improve the individual's performance in economic activities by effecting changes in attitudes, perception, values, and behaviour.

The objective evidence does indicate that there exists some relationship between education and economic activities. But the nature of the relationship is not clear, and at times the evidence is inconsistent. For example, if per capita income is used as an indicator of economic development, --the practice followed by macro-level studies--the evidence demonstrates that "no nation has achieved extensive economic development without also having high literacy rates, upwards of 80 percent."[30] However, the pattern of relationship is curvilinear. Furthermore, when countries with 90 per cent or more literacy are excluded, the rate of educational investment[31] "added virtually nothing to the correlation between literacy and per capita incomes."[32]

The inconsistencies present in these findings seem to arise from several sources. Firstly, some studies are not clear about the direction of the hypothesized relationship between education and economic performance. The

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[30]William A. Herzog, Jr., "Literacy and Community Economic Development," Rural Sociology, 38, No. 3, (1973), p. 325; F.H. Harbison and C.A. Myers, "Strategies of Human Resource Development," in M. Blaug (ed.) Economics of Education II (Middlesex, England: Penguin Books Ltd., 1969), pp. 13-60.

[31]'Net rate of educational investment' refers to the net addition, over a specified period of time, to the number of persons who have completed primary, secondary, and higher levels of education. (The Economics of Education II), pp. 14-17.

[32]Mary Jean Bowman and C. Arnold Anderson, "The Role of Education in Development," in the Brookings Institution, op. cit., pp. 159-60.

practice of using only aggregate data in the study of those relationships contributes nothing to our understanding of the way education enters the process of development. Secondly, few research studies[33] specify the conditions which precede, or combine with education and literacy to trigger off the development process or the "take off" as it is sometimes called.

The few studies which have attempted that type of analysis use micro-level data involving different occupational categories and village level data. These are consistent in their finding that the literate workman-farmer, factory worker, and other categories-manifest attitudinal and behavioural attributes conducive to productive economic behaviour. However, the between group correlation of education and variables related to economic development indicate that "traditional methods of formal education are not only, or necessarily the most effective ways of producing changes in individuals conducive to economic development."[34] For example, Schuman and his associates[35] found that, factory workers and cultivators with the same level of formal education were quite different in their attitudes toward the practice of birth control. Their interpretation of this finding is that the work environment can be considered as a factor in the educational process. Therefore, in addition to formal

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[33]Howard Schuman, et. al., "Some Social Psychological Effects and Non-Effects of Literacy in a New Nation," Economic Development and Cultural Change, 16, (October 1967), pp. 1-14.

[34]Ibid., p. 9.

[35]Schuman, et. al., Ibid., pp. 10-11.

education the work setting should be treated as one of the educational variables which influences attitudes and behaviour relevant to economic behaviour. The more general implication of Schuman's finding is that education includes a wide range of activities, such as on the job training in specific skills, and not just formal academic schooling. In the case of farmers, education would include contact with agricultural extension personnel.

Theoretical Framework

In general, theories of economic development are formulated in terms of variables which do not include the role of individuals and their actions. The few theories which give primacy to the latter set of factors often select independent variables which cannot be translated into policy decisions. The approach which guided this study also gave primacy to the role of individuals and their actions, without ignoring social and economic factors. It involved the following basic assumptions: 1) Economic development, however defined, is the result of a set of activities performed by individuals. 2) Understanding the determinants of behaviour in particular, is a prerequisite to explaining economic development. 3) Economic behaviour and its product, economic development or underdevelopment, are the results of alternative combinations of factors. In other words, it is possible for a farmer to achieve the same net output of farm products by decreasing the number of man-hours devoted to farm work and by increasing the number of rational farm practices. 4) The justification for giving primacy to one set of variables rather than another is the extent to which the variables can be manipulated.

The instrumental value of health in the production process has long been recognized in theoretical discussions of economic behaviour. Alfred Marshall, for example, postulated that health and strength "are the basis of industrial efficiency," and the source of the production of material wealth.[36] While the postulate is accepted by contemporary economists, under the concept of human capital, very few attempts[37] have been made to incorporate the concept into testable economic propositions. Instead of merely agreeing with the assertion, an attempt was made in this thesis to determine empirically the extent to which personal health influences productivity and other aspects of economic behaviour.

Commonsense suggests that a minimum level of health is a necessary condition for engaging in the production process.[38] Thus, it follows also that better health may result in greater output per man-hour. The relationship is not a linear one, and better health will not, of itself lead to increasing productivity in all environments. It is assumed, however, that under conditions of labour-intensive production--as in the domestic agricultural sector of underdeveloped countries--output per worker and the behaviours related thereto are functions of his health status.

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[36]Alfred Marshall, Principles of Economics, Eighth Edition (London: Macmillan and Co., 1938) p. 193.

[37]Wilfred Malenbaum, "Health and Productivity in Poor Areas," in H.E. Klarman (ed.) Empirical Studies in Health Economics, (Baltimore: Johns Hopkins University Press, 1970), pp. 31-54.

[38]Victor R. Fuchs, "The Contribution of Health Services to the American Economy," in J.B. McKinlay (ed.), Economic Aspects of Health Care (New York: Neale Watson Academic Publications, Inc., 1973), p. 82.

There are three ways in which health may influence productivity. Firstly, better health may contribute to productivity by increasing the supply of individual labour. On the other hand, ill-health may reduce that supply through absenteeism. Several observations, such as those reported by Winslow[39] and Taylor,[40] indicate that where the rate of absenteeism is high, and the level of worker productivity is low because of poor health, both conditions can be improved by investing in relatively simple and low cost health programmes. For example, in 1946 certain industries in the Phillipines were able to reduce absenteeism among workers, due to malaria, from 35 per cent to less than 4 per cent by introducing an anti-malaria programme. At the same time, the number of workers required for any given task was reduced by 20 to 25 per cent.[41]

Health status may affect productivity also by reducing labour efficiency. Even if workers remain on the job, their labour input may be greatly reduced: not because the workers have a preference for leisure, but because of physical and mental debility. There are many parts of the underdeveloped world, according to a report of the Food and Agriculture Organization,[42] where people become so adapted to an insufficient supply of calories that they lack initiative,

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[39]C.E. Winslow, The Cost of Sickness and the Prince of Health (World Health Organization: Monograph Series No. 7, 1951), p. 9.

[40]Carl E. Taylor and M.F. Hall, "Health, Population, and Economic Development," Science, 157, (1967), pp. 652-54.

[41]Ibid., p. 653.

[42]The Food and Agriculture Organization, Calorie Requirements, Study No. 15, (Rome: FAO, 1957) p. 7.

avoid physical and mental effort and desire excessive rest.

The third process through which health may affect economic behaviour and productivity operates indirectly. The psychological variables often cited as correlates of economic behaviour, may be themselves conditioned by the individual's level of health. It might be expected, therefore, as some writers assert, that where the labour force is healthy more workers will be found with the spirit of inquiry, innovativeness, and the energy to mobilize and effectively exploit environmental resources.[43] If health status conditions both attitudes and behaviour it should be possible to change economic behaviour by changing health status.

Empirical research concerned with the interrelationship among health, attitudes, and behaviour is limited; and the few available studies are not directly concerned with economic behaviour. However, the findings from these few studies, as well as the investigators' interpretations of those findings, provide some support for the preceding argument.

In Gordon Streib's study[44] of the morale of elderly persons, retired and employed, he found that those who were in good health were better adjusted and employed, he found that those who were in good health were better adjusted and had higher morale than those persons whose health was poor. The indicators of morale were: belief in, and practice of, long-range planning.

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[43]George M. Leiby, "A Community Health Challenge: Northeast Brazil," American Journal of Public Health, 54, (August 1964) p. 1207; Harvey Leibenstein, Economic Backwardness and Economic Growth, (New York: John Wiley and Sons, 1957) pp. 40-41.

[44]Gordon Streib, "Morale of the Retired," Social Problems, 3, (1956), pp. 270-76.

In another study concerning the interrelationships among health status, labour efficiency, and work orientation, Anderson and Eichhorn[45] reported similar findings. Poor health, measured by the number of positive symptoms reported by the respondents, was found to be significantly related to both labour efficiency and work orientation of farmers. Finally, Yoshimura and his associates[46] found that people known to possess positive attitudes toward work, along with those motivational variables often cited as prerequisites of a high level of productivity could be induced to develop negative attitudes by subnecting them to low-calorie diets for a period of time.

There is the possibility that the instrumental value of health in production might be negligible in the capital-intensive sectors of an economy. In these sectors one form of energy--machine technology--can be substituted for human energy. This, however, is unlikely to be the case among peasant farmers in underdeveloped countries. Indeed, all the available evidence supports the view that the basic inputs of traditional agriculture are land and labour, and

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[45]Ronald M. Anderson and Robert L. Eichhorn, "Correlates of Labor Efficiency Among Older Farmers in Poor Health," Rural Sociology, 29, (1964), pp. 181-193.

[46]H. Yoshimura, "Physiological Adaptation to Undernutrition," Abstracts of Papers Related to Nutrition, Public Health and Medical Science, Proceedings, 8 (Tokyo: Eleventh Pacific Science Congress, 1966), p. 21; Harry T. Oshima, "Food Consumption, Nutrition, and Economic Development in Asian Countries," Economic Development and Cultural Change, 15, (July 1967), pp. 385-97.

that labour is the more important of the two factors.[47] It might even be argued, as Mellor does, that an increase in the other basic input of productivity, land, is an indirect form of increase in labour input. For such an increase is likely to be the result of individual action by farmers, without the aid of the types of labour-saving devices and policy-decisions present in technologically advanced countries.[48] Our thesis is that under those circumstances, the health of individual farmers is the crucial variable in the production process.

We recognize, nevertheless, that there are other variables which may influence economic behaviour and levels of productivity among farmers and other workers. It may well be that, due to value orientations, when their health improves some farmers prefer to spend their time in idleness rather than devote more time and energy to economic activities. But this is an empirical question which needs to be investigated. This study expects to find, as most of the preceding discussion suggests, that where health leads, enterprise and the other motivational attributes farmers are said to lack, will follow.

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[47] John W. Mellor, "The Subsistence Farmer in Traditional Economies," in C.R. Wharton, Jr., (ed.) Subsistence Agriculture and Economic Development (Chicago: Aldine, 1970), pp. 209-226; Owen Jefferson, The Post-War Economic Development of Jamaica, (University of the West Indies: Institute of Social and Economic Research, 1972) pp. 79-124; Kingsley Davis, "Institutional Patterns favoring High Fertility in Underdeveloped Areas," in Lyle W. Channon (ed.) Underdeveloped Areas, (New York: Harper and Row, 1957), pp. 93-94, David Edwards, An Economic Study of Small Farming in Jamaica, (Institute of Social and Economic Research: University of the West Indies, 1961), pp. 141-174.

[48] Mellor, op. cit., p. 210

Hypotheses

In the preceding discussion we have argued that physical labour is the basic input of productivity in the peasant sector of underdeveloped countries. We argued that where that was the case the pattern of economic activity among farmers is a function of the level of individual health. In other words, the supply, quality, and consequences of labour were assumed to be dependent upon the health of farmers and agricultural workers. Therefore, to test this theory, we propose the following set of interrelated hypotheses:

Hypothesis 1: The supply of individual labour, or working capacity of farmers in the two communities chosen for study varies directly with the farmers' health status. Conversely, individual supply of labour varies inversely with the number of physical disorders reported.

Hypothesis 2: Labour productivity varies directly with the health status of farmers, when achievement motivation and perceived demand for farm products are controlled.

Hypothesis 3: Labour productivity varies directly with the practice of innovative techniques, when achievement motivation and perceived demand for farm products are controlled.

Hypothesis 4: Attitudes toward farm innovations vary directly with the health status of farmers, when achievement motivation and perceived demand for farm products are controlled.

Hypothesis 5: The level of achievement motivation among farmers varies directly with their health status, when perceived demand for farm products is controlled. Conversely, achievement motivation varies inversely with the

number of physical disorders.

Hypothesis 6: The practice of innovative techniques varies directly with health status, when achievement motivation and perceived demand for farm products are controlled.

CHAPTER III

METHODOLOGY

The Setting

The data for this study were collected from two rural communities in the western section of Jamaica. Their major source of livelihood is small-scale or peasant farming, augmented by fishing and part-time work on nearby large farms. The sizes of peasant holdings range from $\frac{1}{4}$ acre to 6 acres, and approximately 70 percent of those holdings are less than 2 acres each. Most of the farming is done on land which is part of a limestone plateau some 500 or more feet above sea level. The area is also homogeneous in terms of average rainfall and temperature, which range between 40 and 65 inches a year and 70 and 85 degrees Fahrenheit,[1] respectively.

The two communities are located two miles from each other. The inhabitants share a number of public services, including an elementary school, churches, public health services, police protection, and local government. However, the communities differ in a number of ways which we assume have consequences for the types of problems investigated by this study.

The first community (referred in subsequent discussions as Community B) has an estimated population of 1200 persons.[2] It is a coastal village, centrally

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[1] Robert C. West and J.P. Augelli, Middle America: Its Land and Its People, (Toronto: Prentice-Hall of Canada, 1966), pp. 166-173.

[2] Unpublished figures obtained from the local enumerator for the 1972 Census.

located between two towns--Montego Bay and Lucea. The second community (referred to in subsequent discussions as Community A) has an estimated population of 995 persons.[3] In relation to the two towns, this Community is less accessible: there is no direct means of transportation between Community A and towns. It was assumed, therefore, that the diffusion input of ideas and behaviour patterns as they relate to economic and other activities of farmers would vary somewhat between the communities.

Despite the short distance separating the communities, the assumption of variation in diffusion input does not seem unwarranted. Marsh and Coleman,[4] for example, found in their study of innovation practices among Kentucky farmers that the neighborhood with the lowest adoption score was within less than three miles of the neighborhood with the highest adoption score. That study found also that no farmer in either of the neighborhoods made regular visits to a farmer in the other neighborhood. Since the transportation methods which facilitate movement and interaction between communities are less likely to be available to the farmers in this study[5] than those of the Kentucky communities, the possibility exists that differences between the Jamaican communities might be even greater.

The communities are also somewhat different with respect to land tenure

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[3] Ibid.

[4] C.P. Marsh and L. Coleman, "Group Influences and Agricultural Innovations," American Journal of Sociology, 61, (1961), pp. 588-94.

[5] While collecting the data for this study the investigator lived in Community B and had to walk to and from Community A most of the time: there was no other reliable means of transportation linking the two communities.

status. In the more accessible community 30 per cent of the farmers own all or part of the land they utilize, compared to 21 per cent of farmers in the less exposed community. In the latter community, on the other hand, roughly 38 per cent of the farmers rent all or part of the land under cultivation, compared to 30 per cent of the farmers in the other community. Thus, while diffusion input might increase innovativeness, and therefore labour productivity, land tenure status might have the opposite effect. However, the possible opposite effect of diffusion exposure and land tenure status can be determined by within-group correlations, since not all farms in the assumed high diffusion community are owner-operated, neither are all the farms in the low diffusion community tenant-farmed.

Population and Samples

Two random samples of adults aged 18 years and over were drawn from the farming population of each of the two communities. In order to identify the number of farmers in the communities lists of electors were obtained from the regional office of the Chief Electoral Office. Those lists contain both the names and stated occupations of elegible voters, as well as the names of persons who will become eligible voters before the next enumeration. In Jamaica, the only qualification for voter eligibility is attainment of the statutory voting age. During the time of the study the voting age was 18 years.

Sample Size and Design

The electors' lists from which the number of farmers was compiled showed a total of 364 farmers. Community A had 216, and Community B had 148

farmers. Simple random samples of 115 and 100 farmers were drawn from Community A and Community B respectively. A table of random numbers[6] was used in the selection of the samples. These samples represent 53.2 per cent and 67.6 per cent of the respective populations. All but 6 of the respondents (3.3 per cent) were male or female heads of household who had reported that their main source of livelihood was farming. The 6 farmers operated their own holdings but they were part of other households.

Decisions on the sample size were influenced by practical considerations. In the first place, the time available for data collection was limited to 3 months. Secondly, the personnel available for the field work consisted of a single interviewer. In the circumstances, the largest possible sample on which complete information could be gathered was 215.

Data Collection

The field work was conducted between June and early September 1973, in three stages. In the first two weeks the investigator interviewed community leaders in farming and attended a farmers' association meeting in each of the two communities. These preliminary contacts not only served the purpose of acquainting the farmers and their leaders with the nature and scope of the study in which they were being asked to participate, but generated ideas that were included in the interview schedule used to collect the data. In addition to a pilot survey on farm related matters, preliminary information about the health

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[6] The Rand Corporation, A Million Random Digits, Free Press, Glencoe, Ill., 1955, pp. 1-3. Reprinted in H.M. Blalock, Social Statistics, (New York: McGraw-Hill, 1960), pp. 437-440.

status of the members of the two communities was obtained through discussions with the District Medical Officer and the Chief Public Health Nurse for the area. Health clinic records of 75 out-patients were reviewed also to discover the types of illness, conditions and medical symptoms that should be included in the interview schedule.

Prior to the actual survey, the initial interview schedule was pre-tested on 25 respondents, judged to be similar to those in the sample study. As a result of the pre-test one section of the schedule was eliminated. Originally, a nutritional status schedule was included as part of the data-gathering instrument. However, the pre-test indicated that if it were to be administered there would not be enough time to interview the complete study sample. Therefore, the final form of the data-gathering instrument consisted of 6 sections.

Each section (see Appendix A) covers one aspect of the study as described in the statement of the research problem. Section I consists of questions relating to the socio-demographic characteristics of the respondents, namely: sex, age, education, occupation. Section II is concerned with the respondents' medical history and their self-appraisal of their current physical health. Section III is an achievement motivation scale. Section IV is an innovativeness scale which generates data on the respondents' attitudes toward new ideas and practices in farming. Section V contains questions relating to economic behaviour, namely: labour input, size of farm, earnings from the sale of farm products, etc. The sixth and final section of the questionnaire consists of questions relating to the respondents' participation in local farm organization; the extent of their exposure to extra-community influences, and their sources of information about farming.

The response rate for the sample drawn from the less exposed community (referred to in the subsequent discussions as Community A) was 89.6 per cent. Three farmers (2.6 per cent) refused to participate in the study; one farmer, although willing, had to be eliminated because of a hearing defect; and 8 others (7 per cent) could not be contacted, despite repeated recalls. Therefore, the non-response rate was 10.4 per cent. However, 12 of the respondents had to be excluded from some parts of the data analysis because of incomplete information on one of the questionnaire items.

In the more exposed community (referred to in subsequent discussions as Community B) the response rate was 80 per cent. Two farmers (2 per cent) refused to participate in the study; 2 were unsuitable for interview because they no longer considered themselves farmers; and 16 farmers could not be reached. Thus, the non-response rate for this sample was 20 per cent. But 14 of the respondents had to be excluded from some parts of the analysis because of incomplete information on one of the questionnaire items.

Information obtained about the 24 farmers that could not be reached indicates that 15 of them are part-time farmers. Since the study is mainly concerned with full-time farmers the reduction in sample size, due to non-contact of part-time farmers, is not likely to reduce the representativeness of the samples. Similarly, the respondents excluded from parts of the analysis appeared to be similar to those included on the basis of the information collected on age, sex, farm size, farm practices, and health status.

The results of the attempted interviews are as follows:

	Community A	Community B
Completed	89.6%	80.0%
Refusal	2.6	2.0
Unsuitable	1.0	2.0
Non-contact	7.0	16.0
Total	100.0	100.0
Sample size	(115)	(100)

Section II: Health Interview Schedule

The instrument used for generating data on the independent variable, health status, consisted of 34 illness conditions and medical symptoms usually included on a standard medical checklist.[7] The list was read to the respondents and they were asked to state whether or not they had any of those conditions on the day of the interview or any time between the year 1972 and the date of the interview. There was also an open-ended question aimed at eliciting other conditions and symptoms that might have affected the respondents, but which were not included on the checklist. The respondents were asked to state also, the methods by which their illness conditions and symptoms were treated: that is, whether the reported conditions were being treated by self-medication, professional medical personnel, or by any other source.

The conditions listed were: headache, backache, toothache, bronchitis, high blood pressure, heart trouble, arthritis, rheumatism, stomach ulcer, malaria,

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[7] Ann Cartwright, "Some Problems in the Collecting and Analysis of Morbidity Data Obtained from Sample Surveys," in J.B. McKinlay (ed.) Research Methods in Health Care (New York: The Milbank Memorial Fund Quarterly, 1973), pp. 238-248; Robert M. Drake, et. al., "An Epidemiological Investigation of Coronary Heart Disease in the California Health Survey Population," American Journal of Public Health, 47, (April 1957), pp. 54-57.

kidney trouble, diabetes, typhoid fever, shortness of breath, pain in the chest, bladder trouble, boils, fainting spells, menstrual trouble, rashes or spots, low blood, anemia, pneumonia, bad blood, tuberculosis, scarlet fever, chicken pox, pain when passing urine, fits, paralysis, asthma, internal bleeding, swollen joints, coughing blood, losing weight. It was sometimes necessary to explain such technical terms as diabetes, bronchitis, and scarlet fever.

To some readers the illness conditions included in the Health Questionnaire may seem inappropriate for a study concerned with farmers from a developing country in the tropics. This thinking might arise from the fact that much of the demographic data for developing countries tend to view them as an undifferentiated unit. Consequently, one might assume that disease patterns and the major causes of death in individual countries correspond to those of the developing regions as a whole. However, there is a growing body of literature[8] which indicates that the developing tropical regions vary considerably in their death rates, disease patterns, and leading causes of death. And in some cases the patterns of disease are similar to those of the more developed countries.

With regard to the Caribbean region, the documented demographic data on Barbados, Jamaica, and Trinidad show that the leading causes of death are

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[8] Department of Economic and Social Affairs, The Determinants and Consequences of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors, Volume 1, Population Studies No. 50 (New York: United Nations, 1973), pp. 1-158, Edward G. Stockwell, "Socio-Economic and Demographic Differences Among Underdeveloped Areas," Rural Sociology, (June 1963), pp. 165-175.

not diarrhea, dysentery, enteritis, or malaria. On the contrary, recent reports[9] indicate that chronic diseases such as cerebrovascular disease, ischemic heart disease and other forms of heart disease, and malignant neoplasms are the leading causes of death in Jamaica. According to Roberts,[10] the existing pattern of disease was already evident as early as 1951. Furthermore, the District Medical Officer[11] for the area in which the Health Questionnaire was used informed the present writer that the patterns of disease for the area are similar to those of Jamaica as a whole.

The original questionnaire was first administered to a group of farmers judged to be similar to those finally interviewed. The almost complete absence of positive responses concerning diseases such as malaria, typhoid, and smallpox made the investigator suspicious of the answers. When these were checked out with the Medical Officer for the area he reported that those illness conditions were extremely rare, and that not a single case of malaria or smallpox had been diagnosed since 1963. Further, the distribution of illnesses in the clinic records that were reviewed showed a similar pattern to those reported by the

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[9]H.I. McKenzie, et. al., "Reported Illness and Its Treatment in a Jamaican Community," Social and Economic Studies, 16, (1967), p. 262; Ransford W. Palmer, The Jamaican Economy, (New York: Praeger Inc., 1968), p. 73; World Health Organization, Fourth Annual Report on World Health Situation 1965-1968, No. 192, (June 1971), pp. 153-154; Department of Economic and Social Affairs, Demographic Yearbook 1972 (New York: United Nations, 1973), pp. 588-590.

[10]G.W. Roberts, The Population of Jamaica, (Cambridge: Cambridge University Press, 1957), p. 310.

[11]Personal interview with Dr. Aston King, M.D., The Health Clinic, Hopewell, Jamaica (June 1973).

respondents.

For these reasons, the author agrees with McKenzie and her associates who expressed the view that: "Jamaica offers many opportunities for research in medical sociology of the kind reported for the more developed countries."[12]

Many investigators have commented on the limitations of the interview method of measuring bealth status.[13] For example, since people vary in their perceptions and attitudes toward illness some respondents might not report certain conditions defined by them as minor complaints. On the other hand, some studies employing the interview method of measuring health have reported that respondents tend to over-report the number of illness conditions to which they are subject. Overreporting might be the result of the length of time for which recall is required, and whether the respondent reports on his own illness or a proxy's report is permitted.[14]

While there is no known method which completely eliminates all the limitations of the questionnaire method of collecting information on ill-health, careful use of the technique can improve its reliability. In fact, some health questionnaires achieve a correlation of over 90 per cent with medical

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[12]H.J. McKenzie, et. al., op. cit., p. 263.

[13]David Mechanic and Margaret Newton, "Some Problems in the Analysis of Morbidity Data," Journal of Chronic Diseases, 18, (1965), pp. 569-90; Ann Cartwright, "Some Problems in the Collection and Analysis of Morbidity Data Obtained from Sample Surveys," in John B. McKinlay (ed.) Research Methods in Health Care, (New York: The Milbank Memorial Fund Quarterly, 1973), pp. 235-50; B.S. Phillips and G.S. Streib, "An Analysis of the Validity of Health Questionnaires," Social Forces, 36, (1958), pp. 223-32.

[14]H.I. McKenzie, et. al., "Reported Illness and Its Treatment in a Jamaican Community," Social and Economic Studies, 16, (1967), pp. 262-279.

examinations,[15] while others have been able to identify many diseases overlooked in hospital examinations.[16] In the present survey we tried to avoid underreporting by seeking information on all minor ailments, chronic conditions, and injuries. In addition, no proxy reporting was permitted.

According to Cartwright and others,[17] the theoretically ideal procedure for using the questionnaire method to obtain reliable morbidity information is, to limit the recall period as much as possible. The U.S. National Health Survey for example, employs a two-week recall, but other large-scale studies have obtained reliable reporting by employing a twelve-month recall. For purposes of this study, it was also necessary to employ an 18-month period of recall so that health status and labour productivity for the year 1972 could be compared. But as shown in Table III (Appendix B) there is a moderate degree of internal consistency among the items in the Index. The correlation between each item and the total scores resulted in coefficients of .14 to .61.

Section III: Measures of Achievement Motivation

According to McClelland, achievement motivation or need for achievement is a social value which represents the individual's "desire to do well, not so much for the sake of social recognition or prestige, but to attain an inner

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[15] J.H. Freidsam and Harry W. Martin, "A Comparison of Self and Physician's Health Ratings in an Older Population," Journal of Health and Human Behavior, 4, (Fall 1963), pp. 179-183.

[16] Keeve Brodman, et. al., "The Cornell Medical Index-Health Questionnaire," Journal of American Medical Association, 145, No. 3, (1951), pp. 152-57.

[17] Cartwright, op. cit., p. 37; Odin W. Anderson, "The Utilization of Health Services," in Howard E. Freeman, et. al., (eds.) Handbook of Medical Sociology (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), pp. 349-67.

feeling of personal accomplishment."[18] Furthermore, he argues that economic success at the individual level is associated with achievement motivation.

In this study the term is used to cover statements of belief in, desire for, and attitudes toward achievement of excellence in farming, and a higher standard of living. The statements include those concerning the means and modes of action perceived by the respondents as appropriate for achieving the desired standard of living and other social values.

The most frequently used technique for measuring achievement motivation is the Thematic Aperception Test (TAT). However, it would be cumbersome to use that technique to interview farmers in the field. Instead, we adopted the sentence-completion technique of Rogers and others.[19] This technique has been found to be moderately correlated with the TAT.[20]

Ten incomplete statements, forming an index of achievement motivation, were read to each respondent. The statements were: "For a better life on my farm, I need ____;" "I wish that my eldest son ____;" "In the next 10 years, I'm going to ____;" "My greatest aim in life is ____;" "The thing most necessary for my farm is ____;" "Today, to have success in farming ____;" "Farmers

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[18] David McClelland, The Achieving Society, (Princeton, N.J.: Van Nostrand, 1961), p. 76.

[19] Everett M. Rogers, Modernization Among Peasants: The Impact of Communication (New York: Holt, Rinehart and Winston, Inc., 1969), pp. 249-53. _____ and Ralph E. Neil, Achievement Motivation Among Colombian Farmers, Departmental Bulletin Series AE 346, (Columbus: Ohio Agricultural Experiment Station, 1963).

[20] Denton Morrison, Achievement Motivation: A Conceptual and Empirical Study in Measurement Validity, Ph. D. Dissertation, Madison, University of Wisconsin, 1962.

in this country need ____;" "A good farmer must have ____;" "To earn a good living from farming, a farmer must have ____;" "If my work did not progress, I ____." The score assigned to each item in the scale ranged from 0 to 4, and the possible total score of any respondent was 40.

Section IV: Measures of Innovativeness

Two types of measures were employed to assess the innovativeness of farmers. The first consists of twelve attitude statements or questions concerning the respondents desire or disposition to try out new ideas and practices in farming. This measure of innovativeness was used previously to study peasant farmers in San Antonio, British Honduras.[21] The statements were read to the respondents one at a time, and they were asked to respond in terms of their agreement, disagreement, or indecision.[22] The following are examples of the kinds of questions and statements used: "Do you want to learn new ways to farm?" "A farmer should try to farm the way his parents did ____." The discrimination index, r , of these statements range from .40 to 72.[23]

The second measure of innovativeness also consisted of a set of statements or questions; but these were statements about the number of recommended farm

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[21] J. Gerald Feaster, "Measurement and determinants of Innovativeness Among Primitive Agriculturalists," Rural Sociology, 33, (September 1968), pp. 339-48.

[22] The complete list of the statements used is presented in Appendix A.

[23] This index is the correlation between the criterion score and the continuous score assumed to underlie responses to the statements. Each of the statements included in a scale should have a coefficient of .40 or greater. Chung-Teh Fan, Item Analysis Table (Princenton, N.J.: Educational Testing Service, 1952), also Feaster, op. cit., p. 334.

practices that the respondent had adopted during 1972. The farmers were questioned about: their use of fertilizers, manures, pesticides, new strains of corn, and action they had taken to prevent soil erosion.

Section V: Measures of Economic Behaviour

In this study economic behaviour refers to all the practices and techniques employed by farmers in the production and sale of agricultural goods. These include: man hours per year devoted to farming; farm practices such as, use of fertilizers, soil conservation techniques; size of farm holdings; land ownership status; varieties of crops grown; the extent to which farmers produce for the market, and total earnings from the sale of farm products.

Labour productivity, the main dependent variable to be explained, was defined as the total value of cash crops of a farmer's holding divided by the total input of man-hours per year. The data for its calculation were generated from the farmers' reports of number of days per week devoted to farming, number of hours per day devoted to farming, size of holding, and the money value of farm products (crops, livestock, livestock products) sold during 1972. In addition, farmers were asked to estimate the total quantity of specified commodities produced for sale during that year.

The use of both estimated total cash crop output and estimated total value of that output as indicators of labour productivity, were intended as a test of the reliability of the responses. As a test of the accuracy of the statements regarding the monetary value of products sold, the records of local purchasing agents of commodities such as bananas and sugarcane were to be compared with the statements of the farmers. However, the records available could not

be used: the bulk purchasing of commodities in the communities had been discontinuted for several years.

In the absence of reliable and valid external criteria for evaluating the statements concerning total value output, the respondents were asked to state the price per unit of commodities sold. Knowing the quantities of the different commodities sold and the price per unit of those commodities, the investigator was able to check the reliability of the respondents' statements about total value output.

Design of Data Ananlysis

The data from the interview schedules were coded numerically by the investigator and transferred to 80-column IBM cards by an experienced key punch operator. Thereafter each card was verified against its corresponding interview schedule so as to correct any punching errors that might have been made. All statistical operations were carried out with the assistance of the services of the Computing Centre at Brandon University.

As most of the variables in the study were measured by multiple indicators, each set was first combined into an index or scale. The first of these indexes is the Health Status Index. Construction of this Index followed the approach of previous studies which employed the questionnaire method for assessing the health status of individuals. The sum of the positive responses to the checklist of illness conditions and symptoms was computed for each respondent. These scores were then converted into 5 ranks and the relative frequencies obtained. Respondents who received a total score of fewer than 2 illnesses were categorized in rank 1, while those who had received a total score of 10 or more

illnesses were ranked in category 5. Thus, the lower the rank-order of a respondent on the Health Status Index, the higher is his health status.

Use of number of illnesses as a measure of personal health is justified, in part, by the practice of many sociologists[24] interested in the behavioural effects of health status. Moreover, this approach is consistent with our assumption that illness of any kind reduces either the amount of effort or the quality of a worker's task performance. While a common cold or a temporary headache cannot be equated with diabetes, in the same way that banana is not equivalent to wheat, illnesses have one thing in common: they disrupt task performance, especially in work situations primarily dependent upon human effort. Furthermore, the findings of at least two empirical studies[25] indicate that the total number of illnesses or conditions reported by an individual limit role performance to a greater extend than the pattern of illness.

Achievement motivation, one of the control variables in this study, was

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[24]Bernice Goldstein and Robert L. Eichhorn, "The Changing Protestant Ethic: Rural Patterns in Health, Work, and Leisure," American Sociological Review, 26, (August 1961), pp. 557-65; C. Kadushin, "Social Class and the Experience of Ill Health," Sociological Inquiry, 34, (1966), pp. 70-72; Ronald Andersen and R.L. Eichhorn, "Correlates of Labor Efficiency Among Older Farmers in Poor Health," Rural Sociology, 29, (1964), pp. 181-93; R. Andersen and Lee Benham, "Factors Affecting the Relationship Between Family Income and Medical Care Consumption," in Herbert E. Klarman (ed.) Empirical Studies in Health Economics (Baltimore: Johns Hopkins Press, 1970), p. 77.

[25]Derek Phillips and B.F. Segall, "Sexual Status and Psychiatric Symptoms," American Sociological Review, 34, (February 1969), p. 62; Thomas S. Langer and Stanley T. Michael, Life Stress and Mental Health, (New York: Free Press, 1963), p. 152.

scored by the method devised by Morrison[26] and tested by Neill and others.[27] The response of each interviewee to ten sentence-completion items was assigned a weight of 0, 1, 2, 3, or 4 points, in accordance with the scoring rationale formulated by McClelland.[28]

A score of "0" was assigned to responses indicating no concern with achievement in farming or other occupation. Thus, any response which implied concern with values such as religiosity, familism, honesty, affiliation, power, assistance, or other non-performance response was assigned a score of "0".

Responses which implied concern with only material things received a score of 1. Included in this category were statements relating to wealth, acquisition, ownership, security and other replies concerned more with being rather than doing.

A score of "2" was assigned to responses which implied concern with occupational achievement or success, although not explicitly stated. Statements included in this category indicate a concern with knowledge, new ideas, perseverance, size of undertaking, or other values related to achievement although not concerned with farming per se.

A score of "3" was given to explicit responses indicating direct concern

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[26]Denton Morrison, Achievement Motivation: A Conceptual and Empirical Study in Measurement Validity, Ph. D. Dissertation (Madison, University of Wisconsin, 1962).

[27]Ralph E. Neill and E.M. Rogers, op. cit., pp. 4-7.

[28]David McClelland, The Achievement Motive (New York: Appleton-Century-Crofts, 1953), pp. 110-49.

with achievement-performance related to the respondents' occupation. These responses are indicated by such terms as: good, excellent, better, success, improve, get ahead, proper, and other terms which express explicit-performance goals.

When the respondent makes an explicit statement of a 'need to achieve' in his occupation, the statement is assigned a score of "4". To obtain this score the respondent's statement must contain key terms such as: need, intention, desire, want, try, strive, or their synonyms. For the scale as a whole, the range of scores theoretically possible was between "0" and "40". However, the range actually obtained was between "0" and "25".

In assessing innovative proneness, weights were assigned to each of the twelve responses elicited by the innovativeness interview schedule. Positive responses to items representing acceptance of new ideas and practices were assigned a score of "3"; negative responses were assigned a score of "1"; and neutral responses (undecided, don't know) were given a score of "2". For statements representing non-acceptance of new ideas and practices, the scoring method was reversed. For example, if a respondent agreed with the statement, "A farmer should try and farm the way his parents did," his response was assigned a score of "1"; but if the respondent diagreed with the statement, he received a score of "3". Thus, the innovativeness score of a respondent is represented by the sum of the weights received on each of the twelve statements or questions. Theoretically it is possible for respondents to obtain scores ranging between "0" and "36". And the actual range of scores coincided with the theoretical range.

The items in this scale were found to have a fairly high degree of internal consistency. In other words, correlation between each scale item and the total scores resulted in coefficients between .40 and .72.[29] This suggests that all the statements in the innovativeness scale are measures of the same psychological variable.

Notwithstanding, Likert-type scales such as the one described above are said to possess a number of limitations as measures of attidudinal variables. Some of their critics[30] point out that the scores assigned to the responses of an individual have no absolute interpretation in terms of the psychological continuum of scale values of the statements making up the scale. In other words, they do not represent equally-spaced intervals along the theoretical continuum. A second criticism is that summated rating scales do not contain a zero or neutral point.

However, for purposes of the present study, the above criticisms do not seem relevant. Our purpose required a method that could be used to obtain scores for individuals so that they could be ordered in terms of degree of acceptance and non-acceptance of a psychological object--innovative proneness. According to the evidence from several studies, the method of summated ratings does this ordering of individuals as reliably as the more complicated scaling methods. In fact, the coefficients of reliability range from .81 to .99 for a

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[29] J. Gerald Feaster, "Measurement of Innovativeness Among Primitive Agriculturists," Rural Sociology, 33, (September 1968), pp. 341-44.

[30] Allen Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, Inc., 1957).

22-item scale, and from .77 to .87 for a 7-item scale.[31]

Spearman Rank Order correlation and its corresponding test of significance were used in determining the relationship between health status, achievement motivation, innovativeness, and the different measures of economic behaviour. A preselected confidence level of .05 and a one-tailed test, appropriate for Rho, were used as criteria for deciding on the statistical significance of the observed correlations. The analysis was done by computer, using Statistical Package for Social Sciences (SPSS) subprogramme for correlating ranked data.[32] This subprogramme, like the one for Pearsonian r, produces matrices of correlation coefficients for Spearman's rho and Kendall's tau from which partials can be derived.[33]

Several reasons underlie the choice of Rho for measuring association between the central variables in this study. Firstly, most of those variables are non-quantitative in nature, and if they appear to be quantitative their measurement is not precise. More specifically, the variables were in the form of ordered series. Secondly, since the values of Rho range between -1 and +1, the computed coefficient for two or more variables can be interpreted

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[31] Ibid., pp. 160-162; A.N. Oppenheim, Questionnaire Design and Attitude Measurement (New York: Basic Books, Inc., 1966), pp. 133-142; C.A. Moser and G. Kalton, Survey Methods in Social Investigation, Second Edition (New York: Basic Books, Inc., 1972), pp. 361-66; L.H. Seiler, and Richard L. Hough, "Empirical Comparisons of the Thurstone and Likert Techniques," in Gene F. Summers (ed.) Attitude Measurement (Chicago: Rand McNally, 1970), pp. 169-171.

[32] Norman Nie, et. al., SPSS: Statistical Package for the Social Sciences (New York: McGraw Hill, 1970), pp. 288-292.

[33] Ibid., p. 291.

precisely. Finally, Rho has a power-efficiency of 91 per cent, when compared with the most efficient parametric measure of association, Pearson product-moment correlation.[34]

In determining the relative effect of health status and other selected variables on economic behaviour the empirical or quantitative approach was adopted.[35] A set of zero-order correlation coefficients were computed for the dependent variable, economic behaviour, and each of the assumed independent variables. The resulting coefficients were then tested for statistical significance. Following this, the relative magnitudes of those found to be significant at, or below the .05 level were compared. Thus, the initial criterion for determining the relative effect of health status, achievement motivation and innovative proneness on the measures of economic behaviour is the size of the encorrelations (i.e. correlations between independent and dependent variables.)[36]

The final decision about the relative effect of the various independent variables was made on the basis of coefficients computed with Kendall's partial

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[34]Sidney Seigel, Nonparametric Statistics for Behavioral Sciences (New York: McGraw-Hill, 1956), p. 213.

[35]Herbert M. Blalock, "Evaluating the Relative Importance of Variables," American Sociological Review, 26, (December 1961), pp. 866-74; also H.M. Blalock and A.B. Blalock, Methodology in Social Research (Toronto: McGraw-Hill, 1968), pp. 186-192.

[36]Blalock and Blalock, p. 246.

rank-order correlation.[37] First order partial correlation coefficients were computed for the dependent variable and each independent variable originally found to be significantly related. The magnitudes of these correlation coefficients and the original zero-order correlations were compared to discover whether or not the partial coefficients were smaller.

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[37] Sidney Seigel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill, 1956), pp. 223-229. H.M. Blalock, Jr., Social Statistics Second Edition (New York: McGraw-Hill, 1972) pp. 440-442; Dana Quade, Nonparametric Partial Correlation, Report No. SW 13/71, (University of North Carolina, and Mathematical Center, Amsterdam, 1971).

CHAPTER IV

PATTERNS OF ECONOMIC BEHAVIOUR AMONG PEASANT FARMERS

The data in this chapter represent the descriptive findings of the investigation on the characteristics and practices of the total sample of 183 peasant farmers studies. These data cover the following areas:

1) Socio-demographic characteristics of the farmers;

2) Types of farm activities;

3) Work patterns of the farmers;

4) Patterns of decision-making with respect to farming;

5) Involvement in farmers' associations and other community activities;

6) Exposure to extra-community influences.

Socio-demographic Characteristics of the Population Samples

The sample from Community A consists of 76 males (73.8 per cent) and 27 females (26.2 per cent) compared to 71 males (88.8 per cent) and 9 females from Community B. The sample from Community A consisted of 92 full-time farmers (89.3 per cent) and 11 part-time farmers (10.7 per cent), while the sample from Community B consisted of 60 full-time (75 per cent) and 20 part-time farmers (25 per cent).

In Community A, the mean age of the farmers was between 45 and 49 years, while the mean age of the sample from Community B was between 50 and 54 years. However, the percentages of farmers in the 60 and over age-group were roughly the same in two samples, 26.8 and 28.8 per cent for Community A and B, respectively.

Approximately 25 per cent of the sample either could not read, or had completed less than one year of formal schooling. Fewer than 14 per cent (13.7%) of them had completed elementary school or 8 years of formal schooling. In fact, the mean number of years of schooling completed is less than 4 years (Table II). Farmers in the younger age-groups have a significantly higher level of education than those in the older age-groups.

TABLE I

PERCENTAGE DISTRIBUTION OF FARMERS BY AGE AND BY COMMUNITY

Age-Groups	Community A Per Cent	Community B Per Cent
Under 24	5.0	1.0
24 - 29	9.0	3.0
30 - 34	11.0	6.0
35 - 39	7.0	10.0
40 - 44	12.0	9.0
45 - 49	11.0	20.0
50 - 54	10.0	9.0
55 - 59	12.0	14.0
60 and over	25.0	29.0
Total	102.0*	101.0*
N	(103)	(80)

*The total exceeds 100 per cent as a result of rounding. When the total in subsequent tables deviates from 100 per cent it should be interpreted also as due to rounding.

TABLE II

PERCENTAGE DISTRIBUTION OF FARMERS BY YEARS OF SCHOOLING COMPLETED AND BY COMMUNITY

Years of Schooling Completed	Community A Per Cent	Community B Per Cent
Less than 1 year	18.0	33.0
1 year and less than 4	18.0	10.0
4 to 5 years	26.0	30.0
6 to 7 years	18.0	20.0
8 years or more	18.0	8.0
Total	98.0	101.0
N	(103)	(80)
Mean	3.77	3.24
Median	4.00	3.75

Health Status of the Farmers

The number of illness conditions and symptoms reported range between "0" and 15. One-half of the farmers reported 5 illnesses or less, while the other 50 per cent reported more than 5, and in some cases as many as 15 illnesses and symptoms. Only 10 per cent of the farmers reported a single illness or no illness.

As shown in Table III, the mean number of illnesses reported by the respondents in Community A is 5.8, compared to 4.4 illnesses for the respondents in Community B. Similarly, whereas one-half of the respondents from Community A reported more than 5 illnesses, the comparable proportion from Community B is 4 illnesses. The observed percentages of farmers who reported between one and nine illnesses are somewhat similar for each of the communities. There is, however, a marked difference between the communities with respect to those farmers who reported ten or more illnesses. Approximately 15 per cent (14.7%) of the respondents from Community A reported ten or more illnesses compared to 1.3 per cent of the respondents from Community B. Consequently, when the samples are compared in terms of the total number of illnesses reported by each, using the chi-square test, the over-all difference was found to be statistically significant at the .05 level.

Types of Illnesses

Table IV indicates that the most prevalent illness conditions are, in order of prevalence: skin diseases, blood diseases and arthritis and rheumatism. Together, those three conditions account for 69 per cent of the total number of illnesses reported. Slightly more than 65 per cent of the respondents reported

TABLE III

PERCENTAGE DISTRIBUTION OF FARMERS BY NUMBER OF ILLNESSES REPORTED AND BY COMMUNITY

Number of Illnesses	Community A Per Cent	Community B Per Cent
None	2.0	1.0
One	6.0	13.0
Two	9.0	9.0
Three	8.0	18.0
Four	14.0	16.0
Five	15.0	14.0
Six	11.0	13.0
Seven	9.0	4.0
Eight	7.0	6.0
Nine	7.0	6.0
Ten	5.0	1.0
Eleven	4.0	-
Twelve	4.0	-
Thirteen	1.0	-
Fourteen	-	-
Fifteen	1.0	-
Total	104.0	101.0
N	(103)	(80)
Mean	5.8	4.4
Median	5.3	4.1
	X^2[1] = 5.082; DF = 1; P .05	

[1] To calculate the chi-square value for Table III, number of illnesses reported was distributed into two categories: 'fewer than 8' and '8 to 15 illnesses'.

TABLE IV

PERCENTAGE DISTRIBUTION OF KINDS OF ILLNESSES[2] REPORTED BY COMMUNITY

Kinds of Illnesses	Community A Per Cent	Community B Per Cent
Infective and parasitic disease	4.0	8.0
Blood diseases	19.0	13.0
Diseases of the respiratory system	5.0	6.0
Diseases of the digestive system	7.0	8.0
Heart disease	5.0	2.0
Arthritis and rheumatism	17.0	16.0
Genitourinary diseases	4.0	2.0
Skin diseases	33.0	40.0
Paralysis	1.0	-
Fractures and dislocations	4.0	7.0
Venereal diseases	1.0	-
Total	100.0	102.0
Number of Illnesses	(211)	(118)
Number of persons reporting	(103)	(80)

[2]The coding is based on the W.H.O. Manual of the International Classification of Diseases, 6th Edition. Reprinted in S. Swatroop, Introduction to Health Statistics (London: Livingstone, 1960) Appendix IV.

one or two skin diseases, while 30 per cent reported blood diseases, and arthritis and rheumatism. High blood pressure was the most prevalent of the blood diseases followed by 'bad blood'.[3] Approximately 15 per cent (14.8 per cent) of the respondents reported the latter condition, while 9.3 per cent reported high blood pressure.

On the whole, the types of illnesses reported appear to be similar in the two communities. In each community skin diseases, blood diseases and arthritis and rheumatism were the most prevalent conditions. But while blood diseases accounted for 19 per cent of the total number of illnesses reported in Community A, they account for less than 13 per cent of the illnesses reported by the respondents from Community B. On the other hand, skin diseases account for nearly one-third of the total number of illnesses reported in Community A, compared with 40 per cent of the illnesses reported in Community B. In terms of numbers of persons affected, there were more than two times as many persons in the sample from Community A who reported blood diseases (38.8 per cent) as those reporting these diseases from Community B (18.8 per cent). Similarly, 23.8 per cent of the respondents from Community B reported that they were troubled with arthritis and rheumatism compared with 34.9 per cent of the respondents from Community A. (See Table I, Appendix B).

There were no outstanding differences between the two sub-samples for the

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[3] In some regions of Jamaica the term 'bad blood' carries two meanings: impure blood, and deviant moral and social traits inherited from one's parents. The data in this study represent the first usage only.

remaining categories of illnesses reported. However, while no cases of paralysis or venereal diseases were reported by respondents from Community B, 3 cases of the former and 1 case of the latter were reported by the respondents from Community A. Also, 10 cases of heart disease were reported by the respondents from Community A, compared with 2 cases reported by the respondents from Community B.

In addition, information collected on 'bed disability days' serves as another indicator of the respondents' health status. As shown in Table V, the observed proportions of respondents who reported bed disability days and restricted work days differ in the two communities. In Community A, 16.5 per cent of the respondents lost between 2 days and 14 work days per year because of illness, compared to 10 per cent of those from Community B. In this community the loss was between one day and 14 days per year.

There is, however, no observable difference between the communities with respect to restricted work days: 35 per cent of the respondents in both communities reported that, on certain days, they had to reduce the amount of farm work done, because of persistent tiredness.

Treatment of Illness

Of 181 persons, who reported one or more illnesses during the 18-month period, 47.5 per cent reported that they were receiving some form of treatment.

TABLE V

PERCENTAGE DISTRIBUTION OF FARMERS BY BED DISABILITY DAYS REPORTED AND BY COMMUNITY

Number of Bed Disability Days	Community A Per Cent	Community B Per Cent[4]
None	84.0	90.0
One day	-	1.0
2 to 3 days	6.0	5.0
4 to 5 days	2.0	1.0
6 to 10 days	3.0	1.0
11 days or more	6.0	1.0
Total	100.0	99.0
N	(103)	(80)

[4]These percentages add up to less than 100 as a result of rounding to the nearest integer.

The types and sources of treatment may be classified as professional, mixed, and non-professional treatment. All treatments received from private medical practitioners, hospitals, and public health clinics will be referred to as professional; those involving home remedies and unprescribed patent medicines are termed non-professional treatment; while treatments which combine the professional and non-professional categories are termed mixed treatment.

Table VI provides information on the various sources of treatment. In Community A approximately 46 per cent of the respondents (45.6%) who reported one or more illnesses indicated that they were receiving some kind of treatment. The other 54 per cent of the respondents stated that they were receiving no treatment. In Community B the proportion receiving treatment was identical with the proportion that had received no treatment. Approximately 16 per cent of the respondents from Community B (16.3 per cent) compared with 13.6 per cent from Community A obtain professional medical treatment. On the other hand, 14.6 per cent of the respondents from Community A receive non-professional treatment compared with 27.5 per cent from Community B. In the case of mixed treatment, (i.e. treatment involving physicians' services, home remedies and patent medicines) the respondents from Community A were more likely than those from Community B to utilize that form of treatment.

Land Tenure

In Jamaica as a whole, there are complex systems of land tenure. These may be classified as: owner-operator, rental, joint-ownership or "family land," and Crown or Government owned land. Land utilized by small farmers might belong to one or more of the above categories.

TABLE VI

PERCENTAGE DISTRIBUTION OF FARMERS BY SOURCES OF TREATMENT AND BY COMMUNITY

Sources of Treatment	Community A Per Cent	Community B Per Cent
None	54.0	50.0
Professional	14.0	16.0
Mixed	17.0	6.0
Non-professional	15.0	28.0
Total	100.0	100.0
N	(103)	(80)

Before the 1950's, 55 per cent of all small farms, representing less than 14 per cent of the land under cultivation, were owned by farm operators. By 1968, although the percentage of small farms had increased to just over 80 per cent of the total number of farms, the total amount of land owned by farm operators had increased by less than 1 per cent.[5]

The data collected on land tenure systems of the two communities in this study indicate that land distribution does not correspond to the national pattern. Approximately 75 per cent of the total sample of respondents reported that they were 'tenant' farmers.

There were three categories of tenants: renters, Crown-land users, and users of both rented land and Crown land. The renters pay the landlord in cash for use of the land. Crown-land users cultivated the land with Government's permission, and paid no rent. The third category of tenant farmers pay in cash for part of the land cultivated but the rest is rent-free.

There were two other patterns of land tenure: owner-operator and part-owner or family land. While the owner-operator may dispose of his farm if he chooses to do so, the farmer who utilizes family land would require the consent of relatives before selling or even leasing the land.

Table VII indicates only slight observed differences in the land tenure status of farmers in the two samples. Approximately 79 per cent of the respondents from Community A owned none of the land used for farming, compared

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[5]Owen Jefferson, The Post-War Economic Development of Jamaica, (University of the West Indies, Jamaica: Institute of Social and Economic Research, 1972), pp. 79-84.

TABLE VII

PERCENTAGE DISTRIBUTION OF FARMERS BY LAND TENURE STATUS AND BY COMMUNITY

Land Tenure Status	Community A Per Cent	Community B Per Cent
Owner-operators	13.0	16.0
Renters	27.0	20.0
Crown land holders	41.0	40.0
Joint-ownership	9.0	14.0
Renter-Crown land holders	11.0	10.0
Total	101.0	100.0
N	(103)	(80)

$X^2 = 2.56$ DF = 4 P .05

with 70 per cent of the respondents from Community B. Also, a slightly higher percentage of the respondents from the latter community than from Community A reported that they were owner-operators. On the other hand, 2 out of 5 respondents from both communities were users of Crown-land only. Similarly, roughly equal percentages of farmers from the two sub-samples (10 per cent) were renters and Crown-lander users. On the whole the differences are not statistically significant, as measured by the chi-square test.

Patterns of Production

Farm size: The size of the typical farm holding was less than 1 acre. As Table VIII indicates, the holdings of 53 per cent of the respondents were in that category. Whereas fewer than 3 per cent of the farmers interviewed operated holdings of more than 4 acres, nearly 1 in 5 of the total number of farmers (18.5 per cent) operated holdings of less than half an acre.

Two of the four farmers in the 5 acres or more category are part-time farmers with approximately 6 acres each. The inclusion of these farmers in Table VIII and subsequent tables does not affect the findings and conclusions of the study since we are mainly concerned with full-time farmers. The other two farmers, who reported holdings of five acres each, were not eliminated from the analysis because they seemed to possess all the other characteristics of our definition of peasant farmer.

The data in Table VIII indicate that the holdings in Community B are somewhat smaller than those in Community A. Approximately 59 per cent of those interviewed in Community B (48.7%) have holdings of less than 1 acre, compared to roughly 49 per cent of the respondents from Community A. On

TABLE VIII

PERCENTAGE DISTRIBUTION OF FARMERS BY FARM SIZE AND BY COMMUNITY

Farm Size	Community A Per Cent	Community B Per Cent
Less than $\frac{1}{2}$ acre	19.0	17.0
$\frac{1}{2}$ acre to 1 acre	30.0	41.0
$1\frac{1}{2}$ acre to 2 acres	30.0	20.0
$2\frac{1}{2}$ acres to 3 acres	14.0	16.0
Four acres	5.0	1.0
Less than five acres	1.0	-
Five acres and over	1.0	4.0
Total	100.0	99.0
N	(103)	(80)
Mean.	1.44	1.50

X^{2}[6] = 1.195 DF = 1 P .05

[6]To calculate the chi-square value for Table VIII farm size was stratified into 2 categories: 'less than 2.5 and 2.5 acres or more'.

the other hand, nearly 44 per cent of the respondents from Community A have holdings between 1.5 to 3.0 acres, compared to 36 per cent of the respondents from Community B. However, the results of the chi-square test indicate that the over-all difference is not statistically significant at the .05 level.

Farm crops: The major crops grown are yams, plantains, corn, vegetables and legumes. Relatively few farmers grow permanent crops such as coffee, pimento, and citrus. Only 6.6 per cent of the total sample reported that they cultivated one or more of those crops. Sugarcane and bananas are grown also, but these are mainly for household consumption.

In addition to crop farming, some farmers also have livestock. Approximately 17 per cent of the respondents from Community A (16.9 per cent) reported that they raised a few pigs, 21.3 per cent raised some chickens, 25.7 per cent raised goats, and 29.9 per cent raised between 1 and 50 head of cows.

Commercial farming: Approximately 15 per cent of the farmers stated that they usually produce crops for sale, but that during 1972 they had had no surplus for sale. Almost 20 per cent of the respondents refused to answer the question about their earnings from the sale of farm products. The remaining 65 per cent reported that they usually produce both crops and livestock for sale to the domestic market.

The estimated total earnings during 1972 range from J$7.00 to J$4,674.00.[7]

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[7] A Jamaican dollar was equivalent to $1.15 (Canadian).

As shown in Table IX, the data for the samples from Community A and Community B suggest that the communities are somewhat different in terms of commercial farming. Although a slightly higher percentage of the farmers in Community A than in Community B produced crops for sale during 1972, both the mean and the median incomes of the total sample of respondents from Community B are higher than those of the respondents from Community A. While the median income is J$98.00 in Community A, it is J$122.50 in Community B. It would appear, therefore, that the degree of commercialization, as measured by median income of the group, is greater in Community B than in Community A.

Examination of the data in Table X reveals also, that the difference between the two communities remains when the respondents are classified as full-time farmers and part-time farmers. Roughly 81 per cent of the full-time farmers from Community A produced crops for sale during 1972, compared with 85 per cent of those from Community B. In the latter community, however, estimated total earnings of full-time farmers ranged from J$30.00 to J$2650.00 compared with J$8.00 to J$1750.00 in Community A. Similarly, the median income in Community B (J$132.75) was roughly 43 per cent higher than the median income (J$96.00) in Community A.

There were more part-time farmers in Community B than in Community A. of the total of 19 such farmers in Community B, 6 of them (31.6 per cent) reported that their total production was for household consumption only. On the other hand, all of the 9 part-time farmers from Community A reported that they had sold a part of their total production to the domestic market. The estimated median income for this category of farmers was J$121.00. In

TABLE IX

PERCENTAGE DISTRIBUTION OF FARMERS BY ESTIMATED TOTAL EARNINGS FROM SALE OF FARM PRODUCTS AND BY COMMUNITY (1972)

Estimated Total Earnings	Community A Per Cent	Community B Per Cent
None	14.0	16.0
Less than J$100.00	24.0	19.0
J$100 - 199.00	14.0	23.0
$200 - 299.00	11.0	8.0
$300 - 399.00	4.0	5.0
$400 - 499.00	3.0	1.0
$500 - 599.00	5.0	3.0
$600 - 999.00	4.0	3.0
$1000 and over	1.0	6.0
N.A.	21.0	18.0
Total	101.0	102.0
N	(103)	(80)
Mean	$191.35	$318.29
Median	$ 98.00	$122.50

TABLE X

PERCENTAGE DISTRIBUTION OF FARMERS BY TOTAL EARNINGS FROM THE SALE OF FARM PRODUCTS, BY COMMUNITY AND BY FARMER STATUS

Estimated Total Earnings From Sale of Farm Products	Community A		Community B	
	Full-time Farmers Per Cent	Part-time Farmers Per Cent	Full-time Farmers Per Cent	Part-time Farmers Per Cent
None	19.0	-	15.0	32.0
Less than J$100.00	29.0	44.0	23.0	21.0
J$100 - 199.00	17.0	22.0	30.0	21.0
$200 - 299.00	13.0	22.0	13.0	-
$300 - 399.00	6.0	-	6.0	5.0
$400 - 499.00	4.0	-	2.0	-
$500 - 599.00	7.0	-	2.0	5.0
$600 - 999.00	4.0	11.0	2.0	5.0
$1000 and over	1.0	-	6.0	11.0
Total	100.0	99.0	99.0	100.0
N	(72)	(9)	(47)	(19)
Mean	191.57	189.56	268.53	441.37
Median	96.00	121.00	132.75	72.50

$X^2 = 3.86$ DF = 1 P .05

comparison, the median income for part-time farmers from Community B was J$72.50.

Labour Input of Farmers: The amount of time devoted to farming was estimated from the respondents' reports regarding the number of days per week and hours per day devoted to farm work. Over 62 per cent of the respondents indicated that during 1972 they devoted between 5 and 6 days a week to farming. Therefore, approximately 40 per cent of the respondents devoted from 1 day to 4 days per week to farming. And for the sample as a whole, the estimated mean number of days devoted to farming during 1972 was 205 days.

Although some farmers reported that they worked for as many as 12 hours a day, the most frequently reported number of hours per day, was 5 to 6 hours of work. Approximately 36 per cent of the respondents devoted 4 hours a week or less to farming; 42 per cent worked for 5 to 6 hours; while 22 per cent devoted 7 hours or more a week to farm work. As indicated in Table XI, the estimated mean number of hours devoted to farm work during 1972 was 695 hours.

A number of differences appear to exist between the work patterns of farmers in the two communities. In Community B roughly equivalent proportions of farmers, 32.9 per cent and 34.2, work 6 to 7 hours and 8 to 9 hours per day respectively. In contrast, 49 per cent of the farmers in Community A work 6 to 7 hours per day compared with under 8 per cent (7.8 per cent) who reported that they worked 8 to 9 hours per day. Similarly, both the estimated mean and the median number of hours for the year differ substantially for the two groups of respondents. The data in Table XI reveal that the mean number

of hours devoted to farming in Community B exceed the number in Community A by nearly 113 hours.

TABLE XI

PERCENTAGE DISTRIBUTION OF FARMERS BY ESTIMATED NUMBER OF HOURS PER YEAR DEVOTED TO FARMING AND BY COMMUNITY

Hours per Year Devoted to Farming	Community A Per Cent	Community B Per Cent
Less than 200	9.0	10.0
200 - 399	13.0	9.0
400 - 499	13.0	5.0
500 - 699	25.0	20.0
700 - 999	33.0	28.0
1000 and over	8.0	29.0
Total	101.0	101.0
N	(103)	(80)
Mean	645.71	758.55
Median	648.30	759.78

In the case of full-time farmers, the estimated mean number of man-hours devoted to farming is significantly higher in Community B than in Community A. As shown in Table XII in 1972 full-time farmers in the latter community invested, on the average, approximately 715 man-hours in farm work compared to the 957 man-hours invested by their counterparts in Community B. Further, while the typical farmer in the latter community supplied more than 1200 man-hours of work to farming his counterpart in Community A supplied less than 1000 man-hours to farming.

Labour productivity: The most frequently used measure of productivity compares output (in physical or value units) with the amount of labour time (man-hours)

expended in its production.[8] This study followed that approach with one modification: the index of productivity for each respondent was computed from three variables, instead of two.

The estimated total farm income of each respondent was divided by the number of hours devoted to farming during 1972 and the number of land units cultivated, i.e. multiples of 1 acre. Such a procedure makes it possible to compare the value output of the respondents in terms of their labour input, without the influence of varying amounts of land.[9]

TABLE XII

PERCENTAGE DISTRIBUTION OF FULL-TIME FARMERS BY ESTIMATED NUMBER OF HOURS PER YEAR DEVOTED TO FARMING AND BY COMMUNITY

Hours per year devoted to farming	Community A Per Cent	Community B Per Cent
Less than 400	12.0	-
400 - 499	14.0	-
500 - 699	28.0	25.0
700 - 999	37.0	37.0
1000 and over	9.0	38.0
Total	100.0	100.0
N	(103)	(80)
Mean	715.0	957.0

[8] Julius Gould and William L. Klob, A Dictionary of the Social Sciences, (New York: The Free Press, 1964), p. 540.

[9] The number of farm holdings operated by a farmer may affect labour productivity if these holdings are located at some distance from one another. One limitation of the present study is that it did not control for number of holdings operated by a farmer.

The data in Table XIII suggest that nearly one-fifth (19 per cent) of the respondents had zero productivity during 1972. In other words, those farmers had produced no farm surplus for sale. For the sample as a whole, the mean and median labour productivity scores were 0.425 and 0.149 respectively. And almost four-fifths of the respondents (79.6 per cent) were below the mean level of productivity. Expressed in monetary terms, the above findings indicate that the mean hourly earnings for the group of farmers studied was approximately 43 cents per unit of land farmed. While nearly 80 per cent received less than

TABLE XIII

PERCENTAGE DISTRIBUTION OF FARMERS BY LABOUR PRODUCTIVITY AND BY COMMUNITY

Productivity Index per unit of land	Community A Per Cent	Community B Per Cent
0.0	19.0	20.0
0.01 - 0.09	16.0	21.0
0.10 - 0.29	33.0	27.0
0.30 - 0.99	30.0	18.0
1.00 - 7.50	2.0	14.0
Total	100.0	100.0
N	(81)	(66)
Mean	0.312	0.563
Median	0.158	0.125

the mean hourly return, approximately one-half of the group (51.7 per cent) earned under 15 cents per hour.

At the lower levels of productivity there appears to be no outstanding difference between the two communities. As shown in Table XIII, roughly one-fifth of the respondents from both communities, 19 per cent from Community A and 20 per cent from Community B, had productivity scores of zero. However, the mean level of productivity for Community B was 0.56 compared to 0.31 for Community A. Therefore, in terms of income from cash crops, the average hourly earnings for the respondents from Community B exceeded the earnings of those from Community A by 80 per cent or 25 cents. On the other hand, while one-half of the respondents from Community A earned approximately 16 cents an hour during 1972, the comparable percentage of farmers from Community B earned less than 13 cents per hour.

As the data indicate, the over-all higher level of productivity in Community B is due partly to the fact that the proportion of respondents at the highest level of productivity is lower in Community A (2.5 per cent) and that in Community B (13.6 per cent). In other words, of the respondents who earned between $1.00 and $7.00 per hour during 1972, Community B had a significantly higher percentage of those respondents than Community A. Also, as will be shown in subsequent tables, Community B had a higher proportion of part-time farmers than Community A. And this category of farmers achieved higher levels of productivity than both their counterparts in Community A and the full-time farmers in both communities.

Full-Time Farmers: A full-time farmer was defined as a respondent who reported that his/her regular job during 1972 was farming, and that he/she usually worked at farming at least 5 days per week. Table XIV suggests that full-time farmers in Community A were somewhat more likely than their counterparts in Community B to have zero productivity. There were approximately 19 per cent of those respondents in Community A compared with 15 per cent in Community B. However, both the mean and the median levels of productivity are higher for the full-time farmers in Community A than in Community B. For full-time farmers in Community A the mean level of productivity was 0.322 compared with 0.257 in Community B. In other words, the average hourly earnings of the latter category of farmers was 26 cents, compared with 32 cents for farmers in Community A. Similarly, in Community A, 50 per cent of the full-time farmers studied earned an hourly return of roughly 15 cents, compared to an hourly return of 12 cents for the full-time farmers studied from Community B.

Part-time Farmers: A part-time farmer was defined as a respondent who used the occupational title of farmer to describe himself, but devoted fewer than 5 days per week to farming. The discussion presented below on labour productivity involves 28 of the part-time farmers - 19 for Community B and 9 from Community A, the other 3 part-time farmers provided no estimate of their total earnings from the sale of farm products.

Part-time farmers from Community B were more likely to have produced no agricultural surplus for sale than their counterparts from Community A. Thus, while 1 in 3 part-time farmers from Community B had zero productivity, in

Community A the proportion was 1 in 9. There were, however, more high productivity part-time farmers from Community B than from Community A. Table XIV indicates that while none of the part-time farmers in the sub-sample for the latter community had achieved productivity scores above 0.99, 7 farmers or nearly 37 per cent of their counterparts from Community B had labour productivity scores of 1.00 or greater. Those differences in the labour productivity of part-time farmers from the two communities are reflected in the magnitudes of the mean and median productivity scores for that category farmers. The estimates suggest that the sub-sample of part-time farmers from Community B produced six times as much (1.318) per unit of land as part-time farmers from Community A, where the mean productivity per unit of land was 0.235. Therefore, from the standpoint of monetary returns, the data suggest that part-time farmers in Community B earned, on the average, J$1.32 per hour compared with 24 cents in Community A.

Farm Practices

This section presents information on the extent of farm mechanization; the use of fertilizers, and other recommended farm practices.

In both communities, farming implements consist of hoes, agricultural forks, and in a few cases, animal drawn carts. None of the farmers used any type of mechanical technology. This observation is supported by a 1961-62 agricultural census on farm mechanization in Jamaica. That census reported that, apart from carts and drays, farm holdings of less than 5 acres utilized

mainly human labour in the production of agricultural products.[10]

TABLE XIV

LABOUR PRODUCTIVITY OF FARMERS BY COMMUNITY AND EMPLOYMENT STATUS

Labour productivity per unit of land	Community A		Community B	
	Full-time Farmers Per Cent	Part-time Farmers Per Cent	Full-time Farmers Per Cent	Part-time Farmers Per Cent
0.0	19.0	11.0	15.0	32.0
0.01 - 0.09	18.0	-	26.0	11.0
0.10 - 0.29	32.0	44.0	36.0	5.0
0.30 - 0.99	28.0	44.0	19.0	16.0
1.00 - 7.50	3.0	-	4.0	37.0
Total	100.0	99.0	100.0	101.0
N	(72)	(9)	(47)	(19)
Mean	0.322	0.235	0.257	1.318
Median	0.147	0.276	0.121	0.333

[10] Jefferson, op. cit., p. 88.

Four other practices - the use of fertilizers, pesticides, soil conservation methods, and planting of new strains of corn - were investigated. As Table XV indicates, approximately 40 per cent of the farmers from Community B (39.7 per cent), and 34 per cent from Community A used one or more of the farm practices cited above. Also, there was a tendency for the farmers to adopt only one of the four practices. This pattern of adoption was similar in both communities, except that the sample of farmers from Community B were more likely than the sample from Community A to adopt at least one farm practice. In the latter Community, approximately one-fifth of the sample (19.4 per cent) reported that they adopted one recommended farm practice, compared with approximately one-third of the farmers (32.5 per cent) in the sample from Community B.

The farm practice most frequently reported by farmers falls under the heading of soil conservation. The particular form of conservation was grass or stone contour. As shown in Table XVI, this soil conservation technique was practised by 22 per cent of the farmers in Community A and by 29 per cent of those in Community B. The use of inorganic fertilizers was the next most frequent farm practice reported. However, less than 18 and 9 per cent of the farmers in Community A and Community B respectively were included in that category. These findings are somewhat similar to those reported by the 1961-62 agricultural census of Jamaica: that census reported that only 12.3 per cent of the farms of less than 5 acres used fertilizers.[11]

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[11] Jefferson, op. cit., 89-90.

TABLE XV

PERCENTAGE DISTRIBUTION OF FARMERS BY NUMBER OF FARM PRACTICES AND BY COMMUNITY

Number of Farm Practices	Community A Per Cent	Community B Per Cent
None	66.0	61.0
One	19.0	33.0
Two	9.0	4.0
Three	3.0	-
Four	3.0	3.0
Total	100.0	100.1
N	(103)	(80)

TABLE XVI

PERCENTAGE DISTRIBUTION OF FARMERS BY TYPES OF FARM PRACTICES AND BY COMMUNITY

Communities	No. of Persons in the Sample	Types of Farm Practices: Inorganic Fertilizer	New Strains of Corn	Pesticide	Soil Conservation
Community A	103	(17.5%) 18	(5.8%) 6	(11.6%) 12	(22.3%) 23
Community B	80	(8.8%) 7	(1.9%) 2	(7.8%) 8	(28.8%) 23
Totals		(13.7%)	(4.4%)	(10.9%)	(25.1%)
N		25	8	20	46

Patterns of Decision-making

The study identified three dominant patterns of decision-making among the farmers studied. In the first category are those farmers who made most of their decisions about when to plant, what crops to plant, even how much to plant, after some discussion with other farmers in the community. As shown in Table XVII approximately 40 per cent of the farmers studied fall in that category. Included in the second category are farmers who consult neither members of their household, nor persons outside the family, before deciding on what things should be done on, and in connection with, the farm. Roughly two-fifths of the farmers (39.9 per cent) reported that pattern of farm decision-making. The least prevalent pattern of farm decision-making reported was the family-centred pattern. Approximately 19 per cent of the farmers stated that most decisions relating to farming were made by the adult members of the household.

In the sample from Community A the patterns of decision-making follow the same rank order as that found in the total sample. In other words, the highest percentage of farmers (45 per cent) reported that most decisions relating to farming were made after discussion with other farmers. Next in order of frequency was the individualistic decision-making pattern, which accounted for approximately 33 per cent of the sample of farmers from Community A. Family-centred decision-making was least frequent (22 per cent) among the farmers in that sample.

The pattern of decision-making was somewhat different among the sample of farmers from Community B. As in Community A, the family-centred

pattern was least prevalent among the respondents from Community B. However, a larger proportion of farmers from Community A (22 per cent) than from Community B (16 per cent) reported that farm decisions were made in consultation with other members of the household. For farmers from Community B, the predominant pattern of decision-making was individualistic. As Table XVII indicates, 49 per cent of the respondents reported that most of their decisions concerning farm activities were made independently. Although the extra-familial pattern of decision-making was fairly frequent in both communities, the data suggest that the sample of farmers from Community B were less likely than those from Community A to make farm decisions by consulting other farmers. Nearly 45 per cent of the respondents from the latter Community compared with 35 per cent of those from Community B were included in the extra-familial decision-making category.

TABLE XVII

PERCENTAGE DISTRIBUTION OF FARMERS BY COMMUNITY AND BY PATTERNS OF FARM DECISION-MAKING

Patterns of Decision-making	Community A Per Cent	Community B Per Cent
Extra-familial	45.0	35.0
Family-centred	22.0	16.0
Individualistic	33.0	49.0
Total	100.0	100.0
N	(103)	(80)

Participation in Farm Organizations

Two indicators of participation were used in this study: payment of membership fee and frequency of attendance at meetings.

Of the 183 farmers interviewed, approximately 30 per cent reported that they were members of at least one farm organization. The remaing 70 per cent of the respondents stated that they were not members of any farm organization. Except for 3 of the respondents, the members belonged to a single organization- the National Farmers Association. Both communities had a branch of that association.

During 1972, 41 per cent of the respondents had attended one or more of the association's meetings. The data in Table IX (Appendix E) indicate that, on the whole, farmers in the two communities are similar with respect to participation in farm organizations. Approximately 58 per cent of the respondents from Community A, compared with 60 per cent from Community B, stated that they had attended no meetings during the year. Similarly, the mean number of meetings attended by farmers in Community A was 5.5 compared with 5 meetings for farmers in Community B.

TABLE XVIII

TABULAR SUMMARY OF THE SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE TWO SAMPLES STUDIED

Community Characteristics		Community A (Less exposed)	Community B (More exposed)
Sex:	male farmers	74%	89%
	female farmers	26%	11%
Mean age		45 - 49	50 - 54
Mean years of schooling completed		3.77	3.24
Health status:	10 or ⩾10 illnesses	15%	1.3%
	Arthritis and rheumatism	35%	24%
	Blood diseases	19%	13%
	Heart disease	1.7%	4.7%
	Skin disease	40%	33%
	Bed disability days	16.5% (2-14 days)	10% (2-14 days)
Sources of treatment for illness:			
	Medical	14%	16%
	Non-professional	15%	27%
	Mixed	17.4%	6.3%
Farming characteristics			
	Full-time farmers	89%	75%
	Part-time farmers	11%	25%
Mean number of man-hours per year devoted to farm work		646.0	759.0
	Owner-operator farmers	12.6%	16.2%
	Joint ownership	8.7%	13.8%
	Renters	27%	20%
Farm size of 5 acres or more		1%	3.7%
Labour productivity			
	Median earnings	J$98.00	J$122.50
	Mean earnings	191.35	318.29
Mean hourly earnings per unit of land		.31 cents	.56 cents
Number of farmers interviewed		103	80

Summary and Conclusions

The main substantive findings are as follows:

1. Labour input. For the total sample of farmers from Community A the estimated mean number of man-hours devoted to farming was 646, or approximately 80 eight-hour days per year. In the case of full-time farmers, the estimated mean was 714.8 man-hours, or 89 eight-hour days. In Community B, on the other hand, the estimated mean for the total sample of farmers was 759 man-hours, or approximately 94 eight-hour days. Among full-time farmers the estimated mean number of man-hours was 956.9 or approximately 119 eight-hour days per year. These estimates suggest that the farmers in both communities devote to farming less than one-half of the maximum labour time possible.

2. Size of farm. The typical farm holding was less than 1 acre. Approximately 54 per cent of the farmers operated holdings of that size, and the remaining 46 per cent of the farmers operated holdings which ranged in size from 1.5 to 6 acres.

Approximately 59 per cent of the farmers from Community A operated holdings of less than 1 acre, compared with roughly 49 per cent of the farmers from Community B. Thirty-six per cent of the farmers in this community have holdings which range from 1.5 to 3 acres, compared with 44 per cent of the farmers from Community A.

3. Land tenure status of the farmers. Nearly 75 per cent of the farmers (74.8) were tenants of one kind or another. Over 40 per cent of these farmers were crown land users, cultivating Government-owned lands and

paying no rent for doing so. Another 24 per cent of the farmers paid rent to private landlords for the land they cultivated. The remaining tenants (10.4 per cent of the sample) paid for part of the land cultivated with the rest rent-free. Of the remaing farms, joint ownership and owner-operator tenure account for 11 and 14.2 per cent respectively.

Approximately 79 per cent of the sample of farmers from Community A owned none of the land used for farming, compared with 70 per cent of the respondents from Community B. Approximately 40 per cent of farmers in each sample were users of Crown-land only. The percentage of farmers who owned part or all of the land cultivated was somewhat higher in Community B (30 per cent) than in Community A (21.3 per cent).

4. Farm practices. None of the farmers used any type of machinery. Of the other four farm practices investigated-the use of fertilizers, pesticides, soil conservation techniques, and the planting of new strains of corn-none had been adopted by 64 per cent of the farmers. Of the 36 per cent of farmers comprising the adopter category, most of them had adopted only one farm practice.

Grass or stone contour was the practice most frequently adopted, followed by the use of inorganic fertilizers. Each of these practices was adopted by 25.1 and 13.7 per cent respectively, of the total sample of farmers.

The patterns of adoption were similar in both communities, except that the sample of farmers from Community B was more likely than the sample from Community A to adopt at least one farm practice. In the latter Community 19.4 per cent reported that they had adopted one recommended farm practice,

compared with 32.5 per cent of the farmers in the sample from Community B.

5. Degree of commercial farming. Eighty-four per cent of the sample from Community A, and 86 per cent from Community B indicated that they usually produced some products for sale to the domestic market. In 1972 the estimated total earnings from those sales ranged from J$7.00 to J$1750.00 in Community A, and from J$30.00 to J$4674.00 in Community B. Thus, the mean incomes were J$191.35 and J$318.29 for Community A and B, respectively. One per cent of the farmers from Community A had earnings of more than J$1000.00, compared with 6 per cent of the farmers from Community B.

The degree of commercialization, as measured by the median income of the group, was greater in Community B than in Community A. The median incomes for the two communities were J$122.50 and J$98.00, respectively. Full-time and part-time farmers were different with respect to the amount of income received from the sale of farm products. In Community A part-time farmers earned nearly 30 per cent more than full-time farmers, but in Community B part-time farmers earned nearly 50 per cent less from farming than full-time farmers in the same community.

6. Labour productivity. This represents the average hourly earnings of a farmer per unit of land cultivated. Although both communities had roughly equal percentages of farmers who had produced no surplus for sale, the mean level of productivity (0.56) in Community B was higher than the mean (0.31) in Community A. In other words, farmers in Community A earned an average return of 31 cents per unit of land cultivated compared with 56 cents for farmers in Community B. The explanation is that there were more part-time

farmers in Community B than in Community A, and that those part-time farmers, as a whole, were more productive than their counterparts in Community A.

However, in terms of full-time farmers alone, both the mean and the median levels of productivity are higher in Community A than in Community B. In the latter community, the estimated mean hourly income was 26 cents, compared to 32 cents in Community A. Similarly, 50 per cent of the full-time farmers in Community A earned an hourly return of 15 cents, compared with an hourly return of 12 cents for their counterparts in Community B.

7. Patterns of farm decision-making. The patterns identified were classified as: extra-familial, family-centred, and individualistic. Farmers in the first category made most of their decisions about when to plant, and what crops should be planted, after some discussion with other farmers in the community. The family-centred was least prevalent, and it was practised by less than 20 per cent of the farmers. Before deciding on what things should be done on and in connection with the farm, the family-centred farmers discussed such matters with the adult members of the household. Slightly more than two-fifths of the farmers (40.1 per cent) are included in the individualistic category of decision-makers. These farmers consult neither members of their household nor persons outside of the family before deciding on what things should be done on and in connection with the farm.

In both communities, the family-centred pattern of decision-making was least prevalent; but a larger percentage of farmers in Community A (23.3 per cent) practised that form of decision-making. Farmers in Community A were also more likely to practice the extra-familial pattern than farmers in Community B.

In the latter, the pattern was more likely to be individualistic. Nearly 49 per cent of these farmers, compared with 33 per cent of those from Community A, indicated that decisions relating to the farm were made without consultation with other persons.

8. Participation in Farm Organizations. Each of the two communities had a branch of one of the national farmers organizations, but only 30 per cent of the respondents indicated that they were members of the organization. During 1972 the farmers, on the average, attended less than one-half of the 12 meetings held during the year. This relatively low level of participation might be one of the factors which contributed to the low percentage of farmers who adopted recommended farm innovations.

The first conclusion suggested by these data is, that the actual amount of labour time which a farmer devotes to productive farming is less than one-half of the possible maximum.[12] In other words, the estimated 956.9 and 759 hours of farm work supplied by each full-time farmer in Community B and Community A respectively are equivalent to 119 and 94 eight-hour days per year. This implies that, for the populations sampled, most farmers were unemployed or underemployed for the equivalent of between 142 and 167 days

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[12]The possible maximum was arrived at by subtracting 104 days for Saturdays and Sundays from 365 days.

during 1972.[13]

Several factors contribute to the reduction of the amount of labour time devoted to farming. For four months of the year - May, June, September and October - daily rains prevent the farmers from working in their fields for about one-half of each working day. While no information was collected on this factor, the writer's observation during August and early September of 1973 is offered in support of the assertion. Thus, it is estimated that about one-third of the potential total number of man-days that could be devoted to productive farming is lost because of weather conditions.

The second factor which might reduce the number of man-days devoted to farming is illness. Labour time might be lost as a result of bed-disability days and restricted work days.[14] The data from this study show that on the average, farmers lost fewer than 2 days per year as a result of bed-disability. It appears, though, that restricted work days contributed substantially to the reduction of labour time devoted to productive farming. For 35 per cent of

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[13] If the number of hours in a normal working day be fixed at 6 instead of 8 hours, and the possible maximum number of working days for the year be fixed at 256 (excluding 104 days for Saturdays and Sundays and 5 public holidays), the estimated mean number of man-days invested by full-time farmers in Community A would increase from 94 to approximately 127 man-days during 1972. In Community B the increase would be from 119 to 160 man-days during the year. While these estimates reduce the extent of underemployment among the populations sampled, they suggest that, on the average, full-time farmers in Community A and Community B were unemployed or underemployed for the equivalent of 129 and 96 days respectively, during 1972.

[14] 'Restricted work days' refer to those days when a worker, although working at his job, reduces the usual amount of work on account of illness or injury.

the farmers, although not absent from work, indicated that they had to reduce the usual amount of farm work, on certain days, because of persistent tiredness or as a result of backache. While these data do not permit a definitive statement on the amount of time lost through illness and debility combined, they suggest that ill-health contributes to the reduction in the potential supply of labour among the farmers studied. Indeed, farmers in Community A reported a higher number of illnesses than those from Community B, and they also devoted fewer man-days of work to farming.

Preference for leisure over work is one of the other factors which might contribute to the relatively low supply labour among farmers. In fact, as mentioned elsewhere in this thesis, many observers of economic behaviour among workers in underdeveloped countries, including Jamaica, have asserted that a distaste for hard work coupled with limited aspirations are the determinants of the low supply of labour in those countries. There is, however, no evidence in this study to indicate that farmers in general preferred leisure at the expense of work. Approximately 86 per cent of the sample from Community A and 75 per cent from Community B expressed the belief that 'a man can usually improve his standard of living by hard work', while only 6 per cent from Community A and 16.5 per cent from Community B did not believe that hard work could produce that effect. Furthermore, although the farmers gave a wide range of reasons for not engaging in farm work on certain days, only 10 per cent of the respondents in either community indicated that they had been resting during that time.

Finally, the difference between potential and actual amount of labour

time devoted to farming might be partly due to the unavailability of sufficient farm work to keep them employed. Farm holdings are so small - typically less than 1 acre per farmer - that a farmer could be continuously employed for most of a year only by means of very intensive and probably redundant farming. Estimates from a number of sources[15] indicates that, in tropical regions where agricultural production depends mainly upon manual labour, a farmer requires between 1.9 and 2.0 hectares of land (4.7 and 4.9 acres) to keep him fully employed for a year of 300 days.

The data and the estimates derived from them indicate also that, on the whole, part-time farmers achieve higher levels of labour productivity than full-time farmers. Since part-time farmers, by definition, devote less time to farming than full-time farmers, this implies that it might be possible to transfer part of the labour time of full-time farmers to other activities without reducing farm production. But in practice, the transfer would only be possible if alternative employment opportunities existed elsewhere, and if the farmers were willing to make the transfer. In any case, the finding indicates that a certain amount of disguised unemployment existed among full-time farmers in the communities studied.

Further, in both communites, the existing methods of farming were not conducive to high levels of productivity. Although it would be uneconomical

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[15]Colin Clark and M. Haswell, The Economics of Subsistence Agriculture, Fourth Edition, (London: Macmillan, 1970), pp. 116-130.

to introduce any form of machine technology on holdings as small as those studied, the use of manures, fertilizers, and other relatively cheap soil conservation techniques might increase productivity. However, these practices were utilized by less than 39 and 34 per cent of the farmers in Community B and Community A respectively, partly because of cost, traditional beliefs, and lack of knowledge concerning the effectiveness of those techniques. Under these circumstances, a programme of agricultural extension education combined with a subsidized fertilizer scheme might serve to improve production.

CHAPTER V

SOCIO-MEDICAL CORRELATES OF ECONOMIC BEHAVIOUR

The preceding chapter presented substantive findings concerning socio-demographic characteristics of 183 peasant farmers in two Jamaican communities, as well as the basic patterns of farming in those communities. This chapter will present an analysis of those variables which were found to be associated with the observed patterns of economic behaviour among 147 of the farmers interviewed. It was necessary to eliminate 36 farmers from this phase of the study since they did not provide the complete information required for calculating estimates of labour productivity. These farmers were either unable or unwilling to supply the necessary information concerning total farm earnings during 1972.

The analysis will include separate presentations and discussions of correlations for each sample and sub-sample of farmers from the two communities. In other words, the analysis will explore between-category differences as well as within-category differences of economic behaviour. Each phase of the analysis will include two sets of correlation coefficients. The first set involves the zero-order correlations of several indicators of economic behaviour and the hypothesized socio-medical independent variables. Following this, the first-order partial correlations resulting from significantly related paired variables and single control variables will be presented and discussed.

Health and Other Correlates of Economic Behaviour

The first hypothesis of this study asserted that individual supply of labour varies inversely with ill-health. For purposes of this study labour supply and health status were measured by number of hours per year devoted to farm work and number of illnesses reported, respectively. Table XIX presents the correlations between these variables and the correlations between number of illnesses and other indicators of economic behaviour for the two samples of farmers from Community A and Community B.

Examination of Table XIX-A shows that the two indicators of labour supply-days per year and hours per year devoted to farming are significantly related to number of illnesses reported. Also, the direction of the relationships corresponds with what was hypothesized. In other words, there seems to be an inverse relationship (-.28) between days per year devoted to farming and the level of ill-health among the farmers. Similarly, as is to be expected, there is a significant positive relationship (+.66) between the number of days devoted to farming and the number of hours per year devoted to farming. But the fact that this relationship is not a perfect one suggests that the farmers do not all define a day in the same way. Therefore, a better measure of individual supply of labour seems to be hours per year devoted to farming. The correlation (-.35) between this variable and number of illnesses reported also supports the hypothesis that labour supply is inversely related to illness.

Table XIX-A also shows the zero-order correlations for two other dimensions of economic behaviour - labour productivity and number of farm practices adopted - and the number of illnesses reported. The observed relationship

between labour productivity and illness (-.05) is statistically insignificant. On the other hand, the correlation (-.27) between number of illnesses and adoption of farm practices is statistically significant ($p < .007$) and the direction is as hypothesized.

The patterns of relationship between the dimensions of economic behaviour and illness in Community B are different from the patterns in Community A. As shown in Table XIX-B, the size of the correlation (-.14) between number of hours devoted to farming and illness is smaller in Community B than in Community A. Furthermore, this relationship is not statistically significant, although the direction is in accordance with what was expected. Similarly, the observed relationship between adoption of farm practices and illness (-.15) is not statistically significant at the .05 level. However, unlike Community A, there is a negative and statistically significant relationship ($p < .05$) between labour productivity and illness in Community B.

Although the results of the foregoing analysis appear to provide some tentative support for the first hypothesis of this thesis, they also indicate that the relationship between economic behaviour and health status is not consistent for all categories of farmers. There appears to be other influences besides health status, which operate in a different direction in each of the two communities. One possible factor which might have contributed to the observed differences between the economic behaviour of farmers in the two communities is the different percentages of part-time farmers included in the samples. One-quarter of the sample from Community B was comprised of part-time farmers compared with 10.7 per cent of the respondents from Community A. It is necessary,

TABLE XIX

RANK ORDER CORRELATIONS BETWEEN NUMBER OF ILLNESSES REPORTED AND SEVERAL MEASURES OF ECONOMIC BEHAVIOUR

Variable Number	Community A (N = 81)				Community B (N = 66)			
	(2)	(3)	(4)	(5)	(2)	(3)	(4)	(5)
(1) Number of illnesses reported	-.28*****	-.05	-.27**	-.35******	-.20*	-.22**	-.15	-.14
(2) Days per year devoted to farming		-.05	.13	.66******		-.05	-.20*	.70******
(3) Labour productivity			.23***	-.01			.17	-.19
(4) Farm practices adopted				.08				-.10
(5) Hours per year devoted to farming				-				-

* Significant at the .05 level
** Significant at the .04 level
*** Significant at the .02 level
**** Significant at the .007 level
***** Significant at the .005 level
****** Significant at the .001 level

therefore, to analyse the relationship between economic behaviour and health status while controlling for the percentage of part-time farmers.

The correlations in Table XX support the earlier tentative conclusion that individual supply of labour is correlated with health status. In both communities, the full-time farmers with fewer illnesses were likely to devote more hours per year to farming than those full-time farmers who had reported many illnesses. But among part-time farmers the correlation between number of illnesses and man-hours devoted to farming, while showing the predicted direction, was not statistically significant at the appropriate probability level.

Among full-time farmers in Community A, three of the four measures of economic behaviour - number of days devoted to farming, number of hours devoted to farming, and number of farm practices adopted - are significantly related to number of illnesses reported. Furthermore, as shown in the first row of Table XX, all but one of the correlations for full-time farmers have increased in magnitude as a result of the control on category of farmer. The exception is the correlation between number of illnesses reported and number of farm practices adopted, which is reduced from -.27 to -.23. On the other hand, the correlation between labour productivity and illness, although still not statistically significant at the acceptable level of probability, has increased from -.05 to -.11.

The correlations calculated for part-time farmers from Community A suggest that neither labour input nor labour productivity is significantly related to number of illnesses reported. These findings are based, however, on a sample of 9 respondents. Therefore, no inferences are drawn from them about

TABLE XX

RANK ORDER CORRELATIONS BETWEEN NUMBER OF ILLNESSES REPORTED AND SEVERAL MEASURES OF ECONOMIC BEHAVIOUR, CONTROLLING FOR CATEGORY OF FARMER AND FOR COMMUNITY

Community A

Variable Number	Full-time Farmers (2)	(3)	(4)	(5)	Part-time Farmers (2)	(3)	(4)	(5)
(1) Number of illnesses	-.31***	-.11	-.23**	-.39*****	.03	.25	-.59*	-.14
(2) Days per year devoted to farming		.01	.18	.67***		.38	.22	-.06
(3) Labour productivity			.29****	.02			-.21	-.07
(4) Farm practices adopted				.14				.16
(5) Hours per year devoted to farming				-				-
		N = 72					N = 9	

Community B

Variable Number	Full-time Farmers (2)	(3)	(4)	(5)	Part-time Farmers (2)	(3)	(4)	(5)
(1) Number of illnesses	-.38***	-.15	-.02	-.31**	-.35	-.24	-.38*	-.11
(2) Days per year devoted to farming		.24*	.00	.47*****		-.27	-.16	.74****
(3) Labour productivity			.10	-.19			.17	-.27
(4) Farm practices adopted				.06				-.00
(5) Hours per year devoted to farming				-				-
		N = 47					N = 19	

* Significant at the .05 level
** Significant at the .02 level
*** Significant at the .004 level
**** Significant at the .007 level
***** Significant at the .001 level

the universe of part-time farmers.

Among full-time farmers in Community B, the number of hours and days per year devoted to farming are the only measures of economic behaviour significantly related to illness. As shown in Table XX-B, the correlations are now substantially higher than what they were before category of farmer was controlled. In fact, the correlation (-.38 between number of illnesses reported and days per year devoted to farming is nearly twice the size of the correlation (-.20) for these variables in the total sample of farmers for Community B. The former correlation (-.38) is statistically significant at the .004 level, while the correlation (-.20) for the total sample is statistically significant at the .05 level. Further, the weak negative relationship (-.14) between man-hours of farm labour and illness changed to a relatively strong, statistically significant relationship (-.31). On the other hand, the size of the correlation between labour productivity and illness was sufficiently reduced to change that relationship from a statistically significant one to a relationship that was not significant.

In general, the observed patterns of relationship between illness and the dimensions of economic behaviour among part-time farmers in Community B are similar to those of full-time farmers and to the total sample of farmers in that Community. But while these correlations are in the predicted direction, and in some cases longer in magnitude than similar correlations calculated for the total sample and for full-time farmers, only the correlation (-.38) between illness and number of farm practices adopted was statistically significant at the .05 level.

These findings provide tentative support for the hypothesis that the supply of labour among farmers varies directly with health status. There is a tendency for farmers with few illnesses to devote more man-hours to farm labour than those who reported a large number of illnesses. It is of course evident that health status is not the only factor which influences amount of time devoted to farming. As seen in Table XIX, when the farmers are stratified by community, the size of the correlation (-.35) between illness and labour input, in Community A, is more than twice as large as the correlation (-.14) in Community B. This suggests that part of the variance in man-hours of farm labour might be due to some community-related factor or factors.

One such factor might be the different percentages of full-time and part-time farmers in each of the two communities. It is possible that part-time farmers who, by definition, divide their labour time between off-farm work and self-employed farming prefer to devote more time to off-farm work than to their own farming, regardless of health status. In fact, the correlations presented in Table XX indicate that when category of farmer is controlled, the relationship between man-hours and illness is statistically significant only among full-time farmers. The conditional correlations for full-time farmers in both communities were also higher than the original correlations. In the case of part-time farmers they were reduced to the point of statistical insignificance. This last finding, like others involving part-time farmers, is inconclusive because of the small number of cases on which it is based.

The above results support the hypothesis that the amount of time devoted to farming is related to health status. But they also suggest one condition

which might be interacting with health status to influence supply of individual labour. It appears that distance from the two towns influences the amount of time devoted to farm activities. Although there is a general tendency for healthy farmers to devote more man-hours to farming than those who are less healthy, that tendency appears to be stronger among farmers from Community A - the less exposed community.

Labour Productivity, Health Status, Achievement Motivation, and Perception of Demand for Farm Products.

The second hypothesis of this thesis is that: labour productivity varies directly with the farmers' health status, when achievement motivation and perceived demand for farm crops are held constant. Achievement motivation and perception of demand were chosen as control variables since theory and some research evidence suggest that they are related to many aspects of economic behaviour. Before controlling for the specified variables the zero-order correlations between productivity and each of the control variables, as well as others known to affect productivity, were calculated.

As shown earlier in Table XIX, the correlation (-.05) between health status (number of illnesses) and productivity is weak and statistically insignificant for the total sample of farmers from Community A. But in the case of Community B, the correlation (-.20) is statistically significant at the .05 level. However, as shown in Table XX, when the farmers were classified by community and type of farmer (full-time and part-time), the resulting correlations among all categories of farmers turned out to be statistically non-significant. It would seem, therefore, that the variance in productivity can be explained in

terms of community-related factors and the category of farmer.

However, at this stage of the analysis, no conclusive statement can be made about the relationship between productivity and health status. For one thing, the conditional correlations, with one exception, are stronger than the original correlation obtained for each of the two samples of farmers. And although they are not statistically significant at the selected .05 level, the directions of those relationships are as hypothesized. It is possible therefore, that a relationship exists between productivity and health status, as demonstrated by a few studies, but the relationship is concealed in the present study because of the relatively small number of respondents involved.

Labour Productivity and Achievement Motivation

In order to complete the test of the second hypothesis, which predicted that labour productivity varies directly with health status when achievement motivation and perceived demand for farm products are held constant, it is also necessary to examine the relationship between productivity and each of the specified control variables, as well as others discussed in the theoretical framework. The first of these variables is achievement motivation.

Contrary to what would be expected from theory, the correlations in Table XXI show virtually no relationship between productivity and achievement motivation. However, this finding is consistent with that of some studies involving peasant farmers in other cultures.[1] But one cannot conclude that

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[1] E.M. Rogers, Modernization Among Peasants (New York: Holt, Rinehart and Winston, Inc., 1969), pp. 267-270.

TABLE XXI

RANK ORDER CORRELATION COEFFICIENTS FOR LABOUR PRODUCTIVITY, AND SELECTED VARIABLES, BY COMMUNITY

Relationship between productivity and:	Community A (N = 81)	Community B (N = 66)
Age	-.02 (N.S.)	-.01 (N.S.)
Achievement motivation	.10 (N.S.)	-.03 (N.S.)
Perception of demand for farm crops	.29***	.42****
Number of illnesses	-.05 (N.S.)	-.22*
Land tenure status	.23**	-.05 (N.S.)
Farm size	.00	-.01 (N.S.)
Family size	+.13 (N.S.)	-.07 (N.S.)
Number of farm practices adopted	23**	.17 (N.S.)
Years of schooling completed	.14 (N.S.)	.25**

* Significant at the .05 level
** Significant at the .02 level
*** Significant at the .004 level
**** Significant at the .001 level

achievement motivation has no effect upon productivity. Indeed, theory and some research suggest that behaviour, economic behaviour in this case, is the result of the combined effect of achievement motivation and the incentive value of the expected outcome of that behaviour. It is possible, therefore, that the need for achievement among farmers will not be translated into hard work and increased productivity unless they perceive that there is a demand for their crops.

The observed absence of relationship between productivity and achievement motivation could be a function also of the degree of reliability and validity of the sentence - completion method of measuring achievement motivation. Although the present study did not test the scale for these characteristics, other studies which used the same items report reliability coefficients ranging from .20 to .75, and validity coefficients between .33 and .45.

Labour Productivity and Perception of Demand

As can be seen in Table XXI, the correlations between productivity and perception of demand are higher than those between productivity and any of the other variables, including the independent variable, health status (number of illnesses). In the total sample for Community A, the correlation (.29) is statistically significant at the .004 level; and in Community B, the correlation (.42) between productivity and perception of demand is statistically significant at the .001 level. These results suggest that, in both communities, peasant farmers who believe that there is a market for the crops they can produce tend to work harder and are more efficient than farmers who believe that there is no market for their crops. Economists like Schultz would explain the correlation between

productivity and perception of demand as the result of awareness of profitability. In fact, that writer asserts that profitability and other economic incentives are the prime determinants of economic behaviour of peasant farmers in less developed countries, and that it is unnecessary to explain that behaviour in terms of sociocultural variables.[2] Although the data from this study seem to indicate that perception of demand or awareness of profitability influences productivity, the relatively small amount of variance explained also suggests that profitability is only one predictor of productivity. Noneconomic variables such as education, and health status also explain part of the variance in productivity.

In the design of this study it had been assumed that the location of the communities would interact with the main independent variables in their impact upon different dimensions of economic behaviour. It was felt, for example, that because Community B is a coastal village situated between two towns and contiguous with a tourist resort the farmers in this community would have more knowledge about agricultural products for which there is a demand than farmers in Community A. Consequently, it was expected that the correlation between labour productivity and perception of demand would be higher in Community B than in Community A. Although Table XXI indicates that the empirical correlations, +.42 and +.29 for the respective communities are different, this difference is not statistically significant at the .05 level. Thus despite the relative

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[2] T.W. Schultz, Transforming Traditional Agriculture, (New Haven, Conn.: Yale University Press, 1964), p. 164.

differences in physical distances between these two rural communities and the towns, there is no evidence that those differences influence the farmers' awareness of market conditions.

Other Correlates of Labour Productivity

Further examination of Table XXI shows that there is little or no relationship between productivity and such variables as: age, farm size, and family size. On the other hand, land tenure status, adoption of farm practices, and level of education are all related to labour productivity, although the relationships are not consistent. Among farmers in Community A, the correlation (.23) between productivity and land tenure status is positive and statistically significant at the .02 level, while in the case of Community B the relationship is negative and non-significant. If any conclusion can be drawn from the latter finding, it seems to be that farmers in Community A are different in their attitudes toward the ownership of land from farmers in Community B.

The number of farm practices adopted is another of the variables found to be related to productivity. In general, the correlations for all categories of farmers indicate that labour productivity tends to rise as the number of farm practices adopted increases. But, as in the case with some of the other correlations reported in Table XXI, community-related factors seem to account for part of the variance in productivity. Thus, while the size of the correlation (.23) for the total sample from Community A is statistically significant at the .02 level, in Community B, the correlation (.17) for productivity and number of farm practices adopted is not statistically significant at the .05 level.

Labour Productivity and Years of Schooling Completed

Finally, the number of years of schooling completed by a farmer appears to exert some influence on the farmer's labour productivity. Examination of the last row in Table XXI shows a weak, although statistically insignificant relationship between those two variables, for the total sample of farmers from Community A. In the case of Community B, the correlation (.25) between productivity and years of schooling is statistically significant at the .02 level. These findings imply that, while formal education might influence labour productivity, it does so selectively or only under certain conditions.

The correlations in Table XXII suggest one of the conditions under which formal education may influence productivity. When the farmers are classified into full-time and part-time farmers, the size of the correlation between productivity and education increases for full-time farmers in Community A. But in the case of part-time farmers in the same Community, the correlation virtually disappeared, and the direction of that relationship changed from a positive to a negative one. This, apparently, is the situation which produced the noncorrelation originally observed between labour productivity and years of schooling completed. However, the observed inverse relationship between productivity and years of schooling among part-time farmers in Community A is statistically insignificant.

In Community B, on the other hand, the correlations show a positive relationship between productivity and years of schooling among both full-time and part-time farmers. The correlations also suggest that years of schooling completed exert a stronger effect on the productivity of part-time farmers than

TABLE XXII

RANK ORDER CORRELATION COEFFICIENTS FOR LABOUR PRODUCTIVITY AND OTHER VARIABLES, BY COMMUNITY AND BY CATEGORY OF FARMER

Relationship between Labour productivity and:	Community A			Community B		
	Total Sample	Full-time Farmers	Part-time Farmers	Total Sample	Full-time Farmers	Part-time Farmers
Age	-.02	-.06	.19	-.04	-.08	.32
Family size	.13	.17	-.21	-.07	-.11	.01
Farm size	-.00	.09	-.53	-.01	-.16	.35
Hours per year devoted to farming	-.01	.02	-.07	-.19	-.19	-.27
Number of farm practices adopted	.23**	.29***	-.21	.17	.10	.17
Perception of demand for farm products	.29***	.38****	-.14	.42****	.30**	.67****
Land tenure status	.22**	.21*	.31	-.05	-.07	.06
Achievement motivation	.10	.12	.26	-.03	-.02	.03
Number of illnesses	-.05	-.11	.25	-.22*	-.15	-.24
Years of schooling completed	.14	.18	-.09	.25**	.13	.46**
	N = 81	N = 72	N = 9	N = 66	N = 47	N = 19

* Significant at the .05 level
** Significant at the .02 level
*** Significant at the .006 level
**** Significant at the .001 level

on the productivity of full-time farmers. While years of schooling completed explain approximately 21 per cent of the variance in labour productivity among part-time farmers, the same variable explains less than 2 per cent of the variance in productivity among full-time farmers.

This difference between the two categories of farmers suggest that some other characteristic of part-time farmers along with years of schooling interact in their impact upon labour productivity. Further examination of Table XXII suggests that perception of demand for farm products might be one of the variables accounting for the difference. Perception of demand is positively and significantly correlated with productivity among both categories of farmers in Community B. But among part-time farmers the magnitude of the correlation is more than twice as large (.67) as the correlation (.30) for full-time farmers. While there is no direct empirical evidence in this study of the interaction between education and perception of demand the view is supported by theory. It is possible therefore, that the observed greater influence of years of schooling on the productivity of part-time farmers in Community B might be due to the combined effect of their relatively higher level of education and their greater awareness of market conditions.

Of the other variables correlated with productivity after stratifying for category of farmer, only adoption practices and land tenure status remained significantly related to productivity. In the case of number of farm practices adopted, there is however, one noticeable although statistically insignificant difference with respect to the conditional correlation for part-time farmers in Community A. The negative sign implies that, among this category of farmers,

productivity tends to decrease when the number of recommended farm practices increase. Although this finding is in conflict with that of other studies, it could mean that the inappropriate use of farm practices, such as inorganic fertilizer, might reduce productivity. A number of farmers reported that they had lost some of their crops after using fertilizers. They felt it had been applied either too strongly or too near to the roots of the plants.

Land tenure status is the other variable which shows some relationship to productivity. Two of the correlations for farmers from Community A yield positive and significant relationships between labour productivity and land ownership status. In the total sample and among full-time farmers, those who own the land they cultivate appear to earn higher incomes than full-time farmers who are non-owners. But among part-time farmers in Community A, the correlation .31, although somewhat larger than that obtained for the total sample, .22, and for full-time farmers, .21, was not statistically significant at the acceptable probability level. Since the absence of a significant relationship could be due to the relatively small number of part-time farmers, it seems logical to conclude that, in Community A, land tenure status is positively related to labour productivity.

With regard to Community B, the correlations show no statistically relationship between land tenure status and productivity. But the signs suggest that, owner-operator full-time farmers tend to be less productive than full-time farmers who do not own the land. In the case of part-time farmers, however, the tendency is reversed: labour productivity tends to be higher among owners.

These findings, regarding the influence of land tenure on labour productivity,

provide some support for the view held in some quarters that, insecurity of land tenure erodes the incentive for full exploitation of the land. However, the extent to which this happens appears to be affected also by conditions specific to the locality or neighbourhood in which the farmers live. For as shown in Table XXII, the effect of land tenure on productivity is different for full-time farmers in the two communities. This difference might be due to the importance farmers in Community A attach to group conformity, in contrast to farmers from Community B. As shown earlier in Table XVII, page 79, the patterns of farm decision-making among farmers in the two communities were noticeable different. In Community A, farmers were more likely to make those decisions in consulation with other farmers, than were the farmers from Community B.

As a final test of the hypothesis that labour productivity varies inversely with number of physical disabilities, partial rank-order correlation was used to control on achievement motivation, perception of demand, land tenure status, age, and years of schooling completed. Each of the five control variables was either found to be significantly related to productivity in this study, or was assumed to be related to productivity on the basis of a number of theoretical discussions.

The partial correlations tend to support the hypothesis that there is an inverse relationship between productivity and illness. But this relationship is not consistent in the two communities, nor among the two categories of farmers studied. As shown in Table XXIII, when achievement motivation, land tenure status, and age were controlled separately, the resulting partial correlation coefficients were virtually identical to the zero-order correlations. This implies

TABLE XXIII

SPEARMAN'S RHO CORRELATIONS BETWEEN LABOUR PRODUCTIVITY AND THREE VARIABLES, CONTROLLING BY PARTIAL RANK ORDER CORRELATION FOR FIVE VARIABLES

Relationship between productivity and:	No Control		Controlling for Achievement Motivation		Controlling on Motivation and Perception of Demand		Controlling on Land Tenure Status		Controlling on Age		Controlling on Years of Schooling	
	Community A	Community B	CA	CB	CA	CB	CA	CB	CA	CB	CA	CB
Illness	-.05	-.22*	-.04	-.22	.04	-.16	-.03	-.22	.04	-.22	-.01	-.19
Farm practices	.23**	.10			.20	.23						
Farm size	-.00	-.01					-.03	-.01				
N	81	66										

* Significant at the .05 level
** Significant at the .02 level

that, regardless of achievement motivation, age, and land tenure status, illness (as measured in this study) influences the efficiency of farm labour. But it also appears that, in the populations sampled, labour productivity was affected by community-related factors not identified in this research. Thus, while the average daily earnings of farmers in Community B tended to increase as the number of illnesses reported decreased, there is no evidence that health status has a similar effect on the labour productivity of farmers from Community A.

In a further test of the relationship between health status and labour productivity, achievement motivation and perception of demand for farm products were controlled simultaneously. The partial correlation for the total sample of farmers from Community A remained unchanged. But in Community B the correlation changed from -.22 to -.16. This seems to indicate that part of the variance in the productivity of the farmers studied is due to the joint effect of their health status and their belief that a demand exists for the crops they can produce. The moderate reduction in the size of the partial correlation also suggests that perception of market conditions influences productivity to a lesser extent than the state of health. In addition, while perception of demand tends to influence the productivity of farmers in Community B, its effect appears to be neutral in Community A.

While this seems to suggest that, on the whole, farmers in Community B have greater access to information about market conditions than farmers in Community A, the results of further analysis of the data suggest that it might not be location which accounts for the difference. The difference appears to be between full-time and part-time farmers, and not a general difference

between farmers in the two communities. Thus, the relationship between productivity and perception of demand appears to be mediated by the personal characteristics of the farmers rather than by community-related factors.

Separate controls on land tenure status and age also produced no change in the original observed relationship between health status and labour productivity. It appears therefore, that the relationship between productivity and health is a positive one, and that this relationship is independent of both age and land tenure status. However, both commonsense and research evidence indicate that age affects both illness and productivity. Thus, the present findings seems to imply that, at every age level, healthier farmers are likely to be more productive than farmers in poor health. This interpretation is consistent with the findings of other studies dealing with the effect of health and behaviour. Andersen and Eichhorn[3] in particular, found that both age and health status were related to labour efficiency, and that control on age resulted in a strong positive relationship between labour efficiency and health status.

Like age, control on land tenure status produced no change in the magnitude of the correlation between labour productivity and health status, in the sample of farmers from Community B. This implies that the weak negative relationship between productivity and number of illnesses is not due to the effect of land tenure status. But since the partial correlation in Community A is somewhat lower than the zero-order correlation for that community, a

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[3]Ronald M. Andersen and Robert L. Eichhorn, "Correlates of Labor Efficiency Among Older Farmers in Poor Health," Rural Sociology, 29, (1964), pp. 181-183.

modification of the earlier conclusion seems necessary. Although health status by itself tends to increase labour productivity, when good health is accompanied with security of land tenure the farmer's productivity can be expected to be higher, in some environments.

Finally, controlling on years of schooling completed produced only slight changes in the correlations between labour productivity and health status. These two variables are negatively related in Community B, but they are not related in Community A. While this finding suggests that level of education does not account for the relationship between labour productivity and health status, it also suggests that the farmer's health status interacts with one or more community-related variables in influencing labour productivity.

Some of the data suggest that the communities are different in their orientation toward farming. In Community A the tendency is to view farming as a way of life. For example, approximately 88 per cent of the respondents indicated that they were engaged in farming because of the personal satisfaction they derived from working on the land, and not for the monetary returns expected from their investments in labour and other resources. The respondents also stated that they did not plan to seek alternative employment even if they continued to earn no profit. On the other hand, 80 per cent of the respondents from Community B stated that they would 'get out of farming' if they did not expect to earn a profit on their investments. Therefore, the observed different effect of health status in the two communities can be interpreted to mean that good health leads to increased labour productivity only in those settings where farming is viewed as a business. Conversely, in those settings where farming

is viewed as the most desireable pattern of living regardless of economic payoff, the state of the farmer's health is not likely to determine how hard he works, and consequently good health is unlikely to lead to increased productivity.

Labour Producitivity, Health Status, Achievement Motivation and Perception of Demand Among Full-time and Part-time Farmers.

With a view to clarifying the relationship between productivity and health status in the second hypothesis, which predicted that labour productivity varies directly with health status when achievement motivation and perception of demand are held constant, separate tests were done for full-time and part-time farmers. As shown in Table XXIV, the results are different from those obtained for the total sample of farmers in each of the two communities. Although productivity and health status are negatively correlated among full-time farmers, as predicted, the correlations are not statistically significant at the .05 level. This is also true when age, achievement motivation, perception of demand, land status, and years of schooling are controlled. These results, therefore, do not support the prediction that health status is directly related to productivity among full-time farmers.

In the case of part-time farmers, the results are inconclusive. The correlations (+.25 and -.24) between productivity and health status, for Community A and B respectively, are not statistically significant at the selected level of probability. However, no conclusion can be drawn because of the small number of cases involved.

The study also analysed the relationship between productivity and farm size. Although the latter variable was not included in the second hypothesis,

TABLE XXIV

SPEARMAN'S RHO CORRELATIONS BETWEEN LABOUR PRODUCTIVITY AMONG FULL-TIME AND PART-TIME FARMERS, AND THREE VARIABLES, CONTROLLING BY PARTIAL RANK ORDER CORRELATION FOR FIVE VARIABLES

Relationship between productivity and:	No Control		Controlling for Achievement Motivation		Controlling on Motivation and Perception of Demand		Controlling on Land Tenure Status		Controlling on Age		Controlling on Years of Schooling	
	Community A	Community B	CA	CB	CA	CB	CA	CB	CA	CB	CA	CB
Full-time Farmers												
Illness	-.11	-.15	-.10	-.15	-.08	-.10	-.07	-.15	-.09	-.13	-.07	-.13
Farm practices	.29**	.10			.29*	.13						
Farm size	.09	-.16					.07	-.16				
N	72	47										
Part-time Farmers												
Illness	.25	-.24	.27	-.24	-.13	-.15	.05	-.26	.21	-.15	.24	-.36
Farm practices	-.21	.17			-.21	.33						
Farm size	-.53	.35					-.63	.35				
N	9	19										

* Significant at the .01 level

** Significant at the .007 level

it is often used by other researchers as a predictor of economic behaviour among peasant farmers. As shown earlier in Table XXI, the results of the analysis for the total samples from the two communities indicate no relationship befween productivity and farm size. But the correlations obtained after sub-classification of the samples into full-time and part-time farmers suggest that farm size may affect productivity, and that the direction of the effect is different for the two categories of farmers. In Table XXIV, the data show a low, positive correlation (.09) between productivity and farm size for full-time farmers in Community A, and a moderately high negative correlation (-.53) for part-time farmers. But these correlations are not significant at the .05 level.

In Community B farm size also appears to affect the labour productivity of full-time and part-time farmers in opposite directions. In the case of full-time farmers the correlation (-.16) is weak and negative, while in the case of part-time farmers the correlation (.35) is moderate and positive. Thus, there appears to be a greater similarity between full-time farmers from Community A and part-time farmers from Community B than that existing between similar categories of farmers in the same locality.

These findings and the preceding ones suggest that both farm size and health status may be related to productivity. But the evidence is not conclusive. It is not possible therefore to draw inferences about the relative effect of health status on labour productivity among the populations sampled.

Labour Productivity, Farm Practices, Achievement Motivation, and Perception of Demand for Farm Products.

The third hypothesis states: labour productivity varies directly with the

practice of innovative techniques, when achievement motivation and perception of demand for farm products are controlled. The relevant data are presented in Table XXIV. Among full-time farmers in each of the two communities, the number of farm practices is positively correlated with productivity. But while the correlation (.29) is highly significant ($p < .007$) in Community A, in Community B the correlation (.10) is not significant at the .05 level. When controls were introduced for achievement motivation and perception of demand for farm products, the magnitude of the correlation (+.29) between productivity and the number of farm practices adopted was unchanged in Community A. In Community B the correlation (+.13) increased slightly. Therefore, it seems reasonable to conclude that, among full-time farmers, labour productivity tends to increase as the number of recommended farm practices increases.

In the case of part-time farmers, a different set of relationships is indicated in both communities. In Community A, the zero-order correlation between productivity and number of farm practices adopted is -.21. This is not statistically significant at the .05 level. No change occurred in its magnitude and direction when achievement motivation and perception of demand for farm products were simultaneously controlled. This finding seems to suggest that, among the part-time farmers, the adoption of recommended farm practices is less likely to result in higher earnings. An alternative possibility is that part-time farmers are less likely to know how much they earned from farming, or, they are less likely than full-time farmers to report accurately their earnings.

In Community B, the pattern of relationship between productivity and adoption practice, among part-time farmers, is similar to the pattern observed

for full-time farmers. The zero-order correlation (.17), as well as the partial correlation (.33) shows a positive relationship between the variables. And although neither of the coefficients is significant at the .05 level, there is a substantial increase in the magnitude of the partial correlation, when achievement motivation and perception of demand are controlled. However, no conclusion can be drawn because of the small number of subjects included in this sub-sample.

Innovativeness, Health Status, Achievement Motivation and Perception of Demand.

The fourth hypothesis investigated in this thesis states: innovativeness among farmers tends to vary directly with their health status, when achievement motivation and perception of demand are controlled. It was expected, in other words, that farmers reporting few illnesses would score higher on a scale measuring attitudes toward innovation than farmers who reported many illness conditions.

The correlations indicate that innovativeness is related to illness and to achievement motivation. As shown in the first row of Table XXV, in the total sample for Community A, the correlation (-.29) between innovativeness and number of illnesses reported is significant at the .004 level. In Community B, the correlation (-.15) is not statistically significant but its sign is negative as predicted. These findings indicate that, for the populations sampled, peasant farmers in good health were more inclined toward the adoption of recommended farm practices than peasant farmers whose health is poor. They also indicate that health status does not have the same effect in both localities. This suggests that some other factor, perhaps of a structural nature, interacts with health status to produce the observed difference in innovative proneness between

TABLE XXV

SPEARMAN'S RHO RANK-ORDER CORRELATIONS BETWEEN ATTITUDES TOWARD AGRICULTURAL INNOVATIONS AND OTHER VARIABLES BY COMMUNITY

Variable Number	Community A			Community B		
	2	3	4	2	3	4
(1) Number of illnesses	-.10	-.10	-.29***	.03	-.10	-.15
(2) Achievement motivation		.00	.19*		-.07	.22**
(3) Perception of demand			.15			-.08
(4) Innovativeness			-			-
		N = 81			N = 66	

* Significant at the .05 level
** Significant at the .04 level
*** Significant at the .004 level

the communities.

Other studies have found that attitudes toward agricultural innovations vary among neighbourhoods, and that the variation is, in part, due to the extent to which farmers interact with one another. March and Coleman,[4] for example, in their study of farmers drawn from thirteen neighbourhoods in Washington County, found that innovative proneness was positively related to the number of contacts which farmers had with one another in their respective communities. As shown elsewhere in the present study, farmers in Community B

[4] C. Paul Marsh and A. Coleman, "Group Influences and Agricultural Innovations," American Journal of Sociology, 61, (1961), pp. 588-94.

appear to interact with one another (i.e., talk about farm matters) to a lesser extent than farmers in Community A. It is possible therefore that the difference in innovative proneness between farmers in the two communities is partly the result of different patterns of interaction.

Attitudes toward agricultural innovativeness are related also to achievement motivation. The correlations between these variables in each of the two samples are positive and statistically significant beyond the accepted minimum level. This seems to indicate that farmers who desire to improve their level of living are more willing to adopt new ideas and practices in farming than those farmers who accept their present level of living. Somewhat similar results were obtained by Rogers and his associates[5] among Colombian peasant farmers. But unlike the present study, the Colombian study also found that the correlation between innovativeness and achievement motivation was strongest in the most traditional communities. The latter finding was interpreted to mean that the traditional communities were less homogeneous in values than the other communities in that study.

With a view to clarifying the inter-relationship between health status, innovativeness, and achievement motivation, separate tests of the hypothesis were done for full-time and part-time farmers in each of the two communities. Comparison of the correlations for full-time farmers in the two samples shows that innovativeness is negatively related to number of illnesses. As shown in Table XXVI, the correlations -.32 and -.24, are also statistically significant

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[5]Rogers, op. cit., p. 258.

TABLE XXVI

SPEARMAN'S RHO CORRELATIONS BETWEEN INNOVATIVENESS AND OTHER VARIABLES, BY COMMUNITY AND BY CATEGORY OF FARMERS

Full-time Farmers	Community A			Community B		
Variable Number	2	3	4	2	3	4
(1) Number of illnesses	-.12	-.12	-.32***	0	.05	-.24*
(2) Achievement motivation		-.01	.19*		.06	.30**
(3) Perception of demand			.23**			-.17
(4) Innovativeness			-			-
		N = 72			N = 47	
Part-time Farmers						
Variable Number						
(1) Number of illnesses	-.05	-.04	-.06	.07	.17	.16
(2) Achievement motivation		-.42	.21		-.29	.15
(3) Perception of demand			-.52			.19
(4) Innovativeness			-			-
		N = 9			N = 19	

* Significant at the .05 level
** Significant at the .02 level
*** Significant at the .003 level

at the .003 and .05 level, respectively. These results indicate that, regardless of community, full-time farmers with few illnesses are more likely to possess favourable attitudes towards scientific farm practices than full-time farmers in poor health.

Number of illnesses reported among full-time farmers in Community A also shows weak and negative correlations with achievement motivation (-.12) and with perception of demand for farm products. However, neither of the two correlations is statistically significant. And among full-time farmers in Community B the variables show no association. These results lead to the conclusion that, for the populations sampled, there appears to be no relationship between health status and achievement motivation among full-time farmers. A similar conclusion applies to perception of demand and health status.

In the case of part-time farmers, however, the test of the hypothesis that health status and attitudes toward innovativeness are positively related produced inconclusive results. The samples are small, and the correlations obtained are weak and not statistically significant.

The data presented in Table XXVI indicate that, in addition to health status, achievement motivation and perception of demand also are related to attitudes toward innovations in agriculture among full-time farmers. In Community A, the last two variables are positively and significantly correlated with innovative proneness. These findings suggest that favourable attitudes toward agricultural innovations may be generated by improving health status, increasing perception of demand, or by increasing the level of achievement motivation. Also, on the basis of the magnitude of the zero-order correlation coefficients,

the most effective method appears to be the first one, followed by perception of demand. While number of illnesses and innovativeness yield a correlation of -.32, perception of demand and achievement motivation yield correlations of .23 and .19 respectively, with attitudes toward innovations.

In Community B, on the other hand, only health status and achievement motivation yield statistically significant relationships with innovativeness among full-time farmers. The zero-order correlations also indicate that achievement motivation is a better predictor of attitudes toward agricultural innovations than the farmers' health status. As shown in Table XXVI, the correlation between number of illnesses and innovativeness is -.24, while the correlation between achievement motivation and innovativeness is .30.

In the case of part-time farmers, none of the variables yielded statistically significant relationships with innovative proneness. Nevertheless, in Community A, the magnitude of correlation (-.52) between innovativeness and perception of demand would suggest that the variables might be related. The correlation (-.42) between perception of demand and achievement motivation suggest that these variables also might be related to each other. Similarly, in Community B, these two variables also appear to be related (-.29) among the part-time farmers. However, no conclusions can be drawn because of the small number of subjects included in the samples.

A further test of the relationship between attitudes toward agricultural innovations and illness was undertaken. This test involves the simultaneous control on achievement motivation and perception of demand for farm products. As shown in Table XXVII, the partial correlations for the total sample of farmers

TABLE XXVII

ZERO-ORDER CORRELATIONS AND PARTIAL RANK ORDER CORRELATIONS (CONTROLLING FOR ACHIEVEMENT MOTIVATION AND PERCEPTION OF DEMAND) OF INNOVATIVENESS WITH NUMBER OF ILLNESSES

Sample Design	N	Zero-Order Correlations	Significance Level	Partial Rank-Order Correlations	Significance Level
Community A	81	-.29	.004	-.25	.03
Full-time Farmers	72	-.32	.003	-.27	.02
Part-time Farmers	9	-.06	NS	-.10	NS
Community B	66	-.15	NS	-.16	NS
Full-time Farmers	47	-.24	.05	-.26	NS
Part-time Farmers	19	.16	NS	.10	NS

from Community A, and the two sub-samples of full-time farmers from Community A and Community B are virtually of the same magnitude as the corresponding zero-order correlations. And with the exception of the partial correlation (-.26) for full-time farmers in Community B, the other two partial correlations are statistically significant beyong the .05 level,[6] and they are in the predicted direction. However, examination of the remaining partial correlations shows that, in the case of part-time farmers from both communities, the relationship between innovative proneness and illness is not statistically significant.

The above findings lead to the conclusion that for the populations sampled,

[6]These significance levels are part of the output which results from the SPSS subprogram for non-parametric partial correlations. See Norman Nie, et. al., Statistical Package for Social Sciences, (McGraw-Hill, 1970), pp. 306-319.

full-time farmers with few illnesses are more willing to accept new ideas and practices in agriculture than full-time farmers with a large number of illnesses. But in view of the small amount of variance in innovative proneness explained by ill-health - less than 7 per cent in Community A and less than 3 per cent in Community B - it seems evident that other factors account for a substantial portion of the variation among the farmers. In the case of part-time farmers, the sample sizes are too small to allow conclusions to be drawn.

Adoption of Farm Practices, Health Status, Achievement Motivation and Perception of Demand for Farm Products.

The final hypothesis of this study asserted that: the practice of innovative techniques in farming tends to vary with the health status of farmers, when achievement motivation and perception of demand for farm products are controlled. In other words, it was expected that, controlling for level of motivation and the farmers' awareness of market conditions, those with few illnesses would adopt a higher number of recommended farm practices than farmers with a large number of physical disabilities.

Examination of Table XXVIII reveals that, in the total sample of farmers for Community A, the number of farm practices adopted during 1972 is related to illness and to achievement motivation. In each case, the correlation is statistically significant ($p < .05$) and it is in the expected direction. But even the higher correlation, -.27, which represents the relationship between adoption practice and health status, explains less than 8 per cent of the variance in number of farm practices adopted. On the other hand, the correlation between adoption practice and perception of demand for farm products indicated that

TABLE XXVIII

RANK-ORDER CORRELATIONS FOR ADOPTION PRACTICES AND OTHER VARIABLES, CONTROLLING ON CATEGORY OF FARMER

Relationship between adoption practices and:	Community A			Community B		
	Total Sample	Full-time Farmers	Part-time Farmers	Total Sample	Full-time Farmers	Part-time Farmers
Number of illnesses	-.27***	-.23**	-.59*	-.15	-.02	-.38*
Achievement motivation	.21*	.17	-.06	.05	.11	-.02
Perception of demand	.07	.00	.34	-.09	-.05	-.07
Man hours of farm labour	.08	.14	.16	-.10	.06	.00
N	81	72	9	66	47	19

* Significant at the .05 level
** Significant at the .02 level
*** Significant at the .007 level

these variables were not correlated with each other.

When the hypothesis was tested by stratifying the total sample into full-time and part-time farmers the conditional correlations provided support for the original findings. Among the full-time farmers in Community A, the number of farm practices adopted is negatively related (-.23) to number of illnesses, and the relationship is significant at the .02 level. The variables are also significantly related (-.59) among part-time farmers. These correlations indicate that, in Community A, farmers in good health are less likely to rely on traditional agricultural practices than farmers inflicted by a large number of physical disabilities. Presumably, ill-health reduces mental alertness and this makes the farmer less able to recognize and learn the more efficient ways of organizing his activities.

Further examination of Table XXVIII shows that, in Community B, the correlations between farm adoption practice and number of illnesses are in the predicted direction for the total sample and for both categories of farmers, but only among part-time farmers are the variables significantly related. This suggests that health status interacts with other factors in determining adoption behaviour. In other words, although health by itself might stimulate the practice of innovations, when it is accompanied by other conditions the effect is even greater.

Table XXVIII suggests that it is among part-time farmers, in both communities, that the relationship between health status and adoption practice is strongest. Presumably, these farmers have more exposure to extra-community contacts in the course of performing off-farm jobs. Those contacts may provide

them with information about market conditions, and with new ideas about efficient agricultural practices. These conditions in combination with the better health of part-time farmers might account for their rate of adoption.

Achievement motivation also shows a weak positive correlation (-.21) with number of farm practices adopted, in the total sample for Community A. However, stratification of the sample into full-time and part-time farmers reduced the size of the original correlations to such an extent that they failed to yield significance at the acceptable probability level.

In some respects, these findings are similar to those of Rogers and his associates.[7] Their study of the relationship between agricultural innovativeness and achievement motivation among six peasant communities in Colombia, found that the relationship was positive in two villages, negative in one, and uncorrelated in the others. The possibility exists that achievement motivation leads to innovativeness only when other conditions are present e.g. when farmers believe that the new practices will yield more profitable results than traditional practices. A further possibility is that the measure of achievement motivation used in both studies is not a valid one. But on the basis of the results obtained in the present study one can conclude that, for the populations sampled, achievement motivation does not appear to be related to adoption behaviour.

A final test of the relationship between health status and practice of farm innovations involved the simultaneous control on achievement motivation and

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[7] Rogers, op. cit., p. 259.

perception of demand for farm products. As shown in Table XXIX, the partial correlations provide some support for the hypothesis, that health status is related to the practice of innovative techniques among the populations sampled. In the total sample for Community A and among full-time farmers in this community, the correlations are negative and statistically significant at the .02 level.[8] Among the total sample from Community B and among full-time farmers from the same community, the correlations while non-significant, have increased in magnitude and their signs are in the predicted direction. In the case of part-time farmers, control on achievement motivation and perception of demand reduced substantially the magnitude of the correlation between health status and farm innovations from -.59 to -.10 in Community A, and from -.38 to .11 in Community B.

TABLE XXIX

ZERO-ORDER CORRELATIONS AND PARTIAL RANK ORDER CORRELATIONS, (CONTROLLING ON ACHIEVEMENT MOTIVATION AND PERCEPTION OF DEMAND) OF FARM ADOPTION PRACTICES WITH NUMBER OF ILLNESSES

Unit of Analysis	N	Zero-order rank correlation coefficients	Significance Level	Partial Rank-order correlation coefficients	Significance Level
Community A	81	-.27	.007	-.27	.02
Full-time Farmers	72	-.23	.02	-.29	.02
Part-time Farmers	9	-.59	.05	-.10	NS
Community B	66	-.15	NS	-.16	NS
Full-time Farmers	47	-.02	NS	-.25	NS
Part-time Farmers	19	-.38	.05	.11	NS

[8] See footnote, p. 124.

The general conclusion suggested by the above findings is that, for the populations sampled, farmers with few illnesses - real or self-defined - tend to be more receptive to new agricultural practices than farmers who reported a large number of illnesses. But the fact that control on motivation and perception of demand weakens the relationship between health and adoption behaviour among part-time farmers, indicates that health status, motivations and perception of demand interact in their impact upon adoption behaviour. In the course of working on large farms which utilize scientific agricultural techniques, part-time farmers become aware of those techniques. Some part-time farmers actually translate that knowledge into ractice when they undertake their own farming. In short, one can assume that the farmer's career pattern is one of the factors which interacts with his health status to determine his adoption behaviour.

Summary and Conclusions

The analysis presented in this chapter was aimed at testing the relative effect of selected value - attitudes, economic variables, and health status, on patterns of economic behaviour among two samples of peasant farmers in Jamaica. The main statistical findings are summarized in Table XXX.

In terms of the relative magnitudes of the correlation coefficients computed for different components of economic behaviour and each of the assumed independent variables, as well as the statistical significance of the coefficients, perceived demand for farm products appears to be the best predictor of labour productivity in the populations sampled. The number of farm practices adopted is next in relative importance. However, each of these variables explains

only a relatively small amount of the variance in labour productivity. Thus, among full-time farmers, perceived demand explains 14.4 per cent of the variance in the more isolated community and 9 per cent in the less isolated community. Similarly, number of farm practices adopted explains 8.4 and 1 per cent of the variance in productivity among full-time farmers in the respective communities.

The best predictor of attitudes toward, and the practice of, farm innovations appears to be the farmers' health status. Although it explains less than 8 per cent of the variance in attitudes among full-time farmers in each of the communities, and less than 9 and 7 per cent of the variance in farm practices in the respective communities, the other independent variables account for much less of the variance in those variables.

TABLE XXX

TABULAR SUMMARY OF THE FINDINGS ON THE HYPOTHESES

Hypotheses	Unit of Analysis	Sample Size	Zero-order Rank Correlation Coefficients	Rank-order partial correlation, controlling for: N-Ach and Perception of Demand	Rank-order partial correlation, controlling for: Achievement Motivation and Perceived Demand	
H_1: Hours per year devoted to farming varies inversely with number of illnesses reported.	Community A	81	$-.35^a$			accepted
	Full-time Farmers	72	$-.39^a$			
	Part-time Farmers	9	$-.14^b$			
	Community B	66	$-.14^b$			
	Full-time Farmers	47	$-.31^a$			
	Part-time Farmers	19	$-.11^b$			
H_2: Labour productivity varies directly with health status, when need-achievement and perception of demand are controlled.	Community A	81	$-.05^b$	$-.04^b$		inconclusive
	Full-time Farmers	72	$-.11^b$	$-.08^b$		
	Part-time Farmers	9	$+.25^b$	$-.13^b$		
	Community B	66	$-.22^a$	$-.16^b$		
	Full-time Farmers	47	$-.15^b$	$-.10^b$		
	Part-time Farmers	19	$-.24^b$	$-.15^b$		
H_3: Labour productivity varies directly with the practice of innovative techniques when achievement motivation and perceived demand are controlled	Community A	81	$.23^a$		$.20^b$	qualified acceptance
	Full-time Farmers	72	$.29^a$		$.29^a$	
	Part-time Farmers	9	$-.21^b$		$-.21^b$	
	Community B	66	$.17^b$		$.23^b$	
	Full-time Farmers	47	$.10^b$		$.13^b$	
	Part-time Farmers	19	$.17^b$		$.33^b$	

TABLE XXX

TABULAR SUMMARY OF THE FINDINGS ON THE HYPOTHESES

Hypotheses	Unit of Analysis	Sample Size	Zero-order Rank Correlation Coefficients	Rank-order partial correlation, controlling for: N-Ach and Perception of Demand	Rank-order partial correlation, controlling for: Achievement Motivation and Perceived Demand	
H_4: Attitudes toward farm innovations vary directly with health status when achievement motivation and perceived demand are controlled.	Community A	81	-.29[a]		-.25[a]	
	Full-time Farmers	72	-.32[a]		-.27[a]	
	Part-time Farmers	9	-.06[b]		-.10	qualified
	Community B	66	-.15[b]		-.16[b]	accept-
	Full-time Farmers	47	-.24[a]		-.25[b]	ance
	Part-time Farmers	19	.16[b]		.10[b]	
H_5: The level of achievement motivation among farmers varies directly with their health status, when perceived demand for farm products is controlled.	Community A	81	-.10[b]	-.10[b]		
	Full-time Farmers	72	-.12[b]	-.12[b]		
	Part-time Farmers	9	-.05[b]	-.16[b]		rejected
	Community B	66	+.03[b]	-.03[b]		
	Full-time Farmers	47	.00	-.00		
	Part-time Farmers	19	.07[b]	-.05[b]		

TABLE XXX

TABULAR SUMMARY OF THE FINDINGS ON THE HYPOTHESES

Hypotheses	Unit of Analysis	Sample Size	Zero-order Rank Correlation Coefficients	Rank-order partial correlation, controlling for: N-Ach and Perception of Demand	Rank-order partial correlation, controlling for: Achievement Motivation and Perceived Demand	
H_6: The practice of innovation techniques varies directly with health status when achievement motivation and perceived demand for farm products are controlled.	Community A	81	-.27[a]		-.27[a]	
	Full-time Farmers	72	-.23[a]		-.29[a]	
	Part-time Farmers	9	-.59[a]		-.10[b]	qualified
	Community B	66	-.15[b]		-.16[b]	accept-
	Full-time Farmers	47	-.02[b]		-.25[b]	ance
	Part-time Farmers	19	-.38[a]		.11[b]	

a = $p < .05$

b = $p > .05$

CHAPTER VI

SUMMARY, CONCLUSIONS AND IMPLICATIONS OF THE STUDY

There is general agreement among students of underdeveloped countries that the central fact of these countries is the low productivity per worker, especially among farmers and agricultural workers. One view asserts that low productivity is a function of limited wants and low need-achievement, mediated by the workers preference for leisure, subsistence production, and the relative absence of innovative behaviour. A second view explains the behaviour of peasant farmers in terms of economic factors, such as insufficient demand and scarcity of physical capital.

This study attempted to identify the patterns of economic behaviour and to test empirically, in a particular setting, the validity of the 'leisure syndrome - limited wants' explanation of those patterns among two groups of peasant farmers. We advanced the thesis that physical labour is the basic input of productivity in the peasant sectors of underdeveloped countries; that where this is the case, supply, quality, and the consequences of labour are dependent upon the health of farmers and other agricultural workers.

A comparative research design was employed for measuring the relative effect of health status, social-psychological and economic variables on economic behaviour. Data were derived from the reports of 183 peasant farmers, selected by random sampling, from two rural communities in the western section of Jamaica. Three measures of the dependent variable, economic behaviour, were

utilized: reported man-hours per year devoted to farming, number of farm practices adopted during the 18-month period covered by the study, and a derived score of labour productivity. Health status was operationally defined as, number of illnesses reported. Achievement motivation and attitudes toward farm innovations were measured by the respondents' total scores obtained from two different sets of scale items.

The following criteria were used for determining the relative effect of health status and other independent variables on the dependent variables. First, a set of zero-order rank correlation coefficients were computed for the measures of economic behaviour and each of the assumed independent variables. Secondly, partial rank-order correlation coefficients were computed for the dependent variable and each of the control variables specified in the hypotheses. The zero-order correlations which are significant at the .05 level and which are not significantly different from corresponding partial correlation coefficients are compared with one another. The relative magnitudes of these correlations provide the final criterion for deciding on the relative effect of the various independent variables.

The data indicate that, for the populations sampled, patterns of economic behaviour are similar to those usually attributed to workers in the peasant sectors of underdeveloped countries. The typical full-time small farmer, in each of the two communities, devotes to productive farming less than one-half of the maximum labour time possible; earns less than J$123.00 per year from the sale of farm products; and does not adopt any of the farm practices recommended by agricultural agencies. But the data also indicate that the typical peasant

farmer operates a holding of less than 1 acre; owns none of the land he cultivates; and that the farmer's labour input is the main component of the production function.

There is, however, no empirical evidence in this study to support the thesis that the observed characteristics are determined by limited aspirations and a preference for leisure at the expense of hard work. Instead, the findings from the research hypotheses formulated to investigate the correlates of economic behaviour suggest that social structural and health factors exercise more influence on the farmers' behaviour than psychological variables. The relevant findings and their interpretation are as follows:

Hypothesis 1: The data support this hypothesis. There is a statistically significant inverse relationship between number of illnesses and number of man-hours devoted to farming among full-time farmers in both communities. This indicates that full-time farmers in good health are likely to devote more time to farm work than their less healthy counterparts. No conclusion can be drawn with respect to part-time farmers because of the small number of cases involved.

Hypothesis 2: This hypothesis states that labour productivity varies directly with health status, when need-achievement and perception of demand for farm products are controlled. One would expect that good health, by increasing the number of man-hours invested in farming, would also increase the farmers' labour productivity. While the empirical correlations, which are of moderate magnitudes, tended to support the expectation, they were not all statistically significant at the selected probability level. This finding suggests that health status and labour productivity are insignificantly related in the populations

sampled.

Thus, although good health may enable the farmer to expend more physical effort on farm activities, the amount of time does not necessarily lead to an increase in average output. The amount of time devoted to farming may make that outcome more likely, but only if it is combined with other factors such as the use of effective farm practices. As Goldstein and Eichhorn[1] found in their study of Indiana farmers, the productive farmers were not those who had invested the highest number of man-days in the farm, but those who had the most rationally organized farms.

The relationship between labour productivity and each of the control variables specified in the second hypothesis was calculated also. In both communities, perception of demand for farm products was found to be positively and significantly ($p < .05$) correlated with productivity. However, the magnitudes of the correlations were, in general, higher in one sample than in the other. Also, the highest correlation (.67) was obtained among part-time farmers drawn from the community judged to be more exposed to the effects of diffusion. These findings seem to indicate that farmers who believe that there is a market for goods they can produce are likely to practice more effective methods of farming, and may work harder, than those farmers who are unaware that a market exists. The findings suggest two other implications. Firstly, awareness of market conditions appears to be influenced by the setting in which the farmer resides. As noted earlier, the respondents in Community B - full-time as well

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[1] B. Goldstein and R. Eichhorn, "The Changing Protestant Ethic: Rural Patterns of Health, Work, and Leisure," American Sociological Review, 26, (1961), p. 563.

as part-time farmers - appear to be influenced by perception of demand to a greater extent than farmers in Community A. This might be due, in part, to differential contact with urban influences. Secondly, the type of part-time work that farmers engage in also seems to affect their perception of demand. This interpretation is suggested by the magnitude of the correlation between perception and labour productivity among part-time farmers in Community B. The part-time work of these farmers is the non-farm type e.g. working at a nearby tourist resort or working at a trade. Other studies[2] of peasant farmers have shown that farmers who are primarily oriented to village life exhibit less awareness of new farm ideas, including marketing arrangements.

Achievement motivation is the other control variable whose relationship with productivity was investigated. Many contemporary students of economic development argue that its behavioural components are determined by, or associated with, the level of achievement motivation among individuals involved in the production process. In this study no statistically significant relationship was found between achievement motivation and labour productivity. Similarly, neither adoption of farm innovations nor size of farm operation was found to be significantly correlated with achievement motivation.

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2. Anne W. van den Ban, "Locality differences in the adoption of new farm practices," Rural Sociology, 25, (September 1960), pp. 308-320; F.C. Fliegel, "Community Organization and Acceptance of Change in Rural India," Rural Sociology, 34, (June 1969), pp. 167-181; William J. Haga, "Trade Patterns and Community Identity, Rural Sociology, 36, (March 1971), pp. 42-51.

Hypothesis 3: There was a positive and statistically significant ($p < .01$) relationship between labour productivity and number of farm practices adopted among full-time farmers in the more isolated community before, and after, perceived demand and achievement motivation were controlled. In the less isolated community, the correlations were all in the predicted direction, but they were not statistically significant at the selected probability level.

These findings provide qualified support for the hypothesis. But they also indicate that the relationship between productivity and the practice of farm innovations is a conditional one. The absence of a statistically significant relationship between number of farm practices adopted and labour productivity in Community B could mean that the relationship is mediated by the appropriate use of farm practices. Since this question was not systematically investigated in the present research the explanation offered requires further testing. However, there was some evidence to this effect. A number of farmers from Community B indicated that they had lost some of their crops after using fertilizer. Furthermore, these farmers expressed the belief that the fertilizer might have been applied too strongly or too near to the roots of the plants.

Hypothesis 4: Among full-time farmers, attitudes toward farm innovations were found to be negatively associated with number of illnesses reported. The correlation coefficients were statistically significant ($p < .05$) in each of the communities, before perception of demand and achievement motivation were controlled. When these variables were controlled, the correlation (-.25) for full-time farmers in Community A, although not statistically significant at the .05 level was slightly higher than the zero-order correlation (.24). Furthermore,

the difference between the magnitudes of these correlations is not statistically significant. These findings indicate that full-time farmers with few illnesses were more favourably predisposed toward new farm practices than full-time farmers with many illnesses.

The interpretation placed on these findings is that good health stimulates positive attitudes toward one's environment, including one's occupation. Farming is a particularly challenging occupation, requiring both physical and mental alertness. Illness, in the form of persistent tiredness and a large number of physical disorders, debilitates the farmer and reduces his interest in any type of action that does not lead to immediate symptom relief. It might be argued also that the causal order of the relationship between health status and innovative proneness is in the opposite direction: that people who are predisposed toward innovations in general are more likely to seek out health care services, and that this may account for their better health. Nevertheless, some of the evidence from clinical and experimental studies lend support to the first interpretation. They demonstrate that people known to have positive attitudes toward their work and other social roles manifested the opposite characteristics after the onset of illness.[3]

Hypothesis 5: The data offered no evidence to support the prediction that the level of achievement motivation among the farmers varies directly with their health status when perception of demand for farm products is controlled. All of the correlations calculated for this hypothesis were very weak, and none of

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[3]Henry Lederer, "How the Sick View Their World," in Gartly E. Jaco (ed.), Patients, Physicians and Illness: Sourcebook in Behavioral Sciences and Medicine (New York: The Free Press, 1958), pp. 247-256; H. Yoshimura, Loc. cit., p. 21 and H.T. Oshima, loc. cit., pp. 385-97.

them was statistically significant at the .05 level.

Hypothesis 6: Among full-time farmers in the more isolated community, there was a negative and statistically significant ($p < .05$) relationship between number of farm practices and number of illnesses reported, when level of achievement motivation and perception of demand for farm products were controlled. In the case of the less isolated community the findings are less clear-cut. Before controls were introduced, the relationship was virtually nonexistent. When perception of demand and achievement motivation were partialled out, the correlation between number of farm practices and number of illnesses reported increased substantially. And although it was not statistically significant at the .05 level this partial correlation coefficient (-.25) was not significantly different from the one (-.29) obtained for full-time farmers in the less exposed community. It appears therefore, that in both communities, full-time farmers in good health were more likely to adopt new farm practices than farmers with many physical disabilities.

In the case of part-time farmers the findings are inconclusive. Although the correlations suggest that the combined effect of achievement motivation and perception of demand exercise a greater influence on the practice of farm innovations, the samples involved are too small to permit any inferences to the populations sampled.

The relationship between labour productivity and three other variables for which hypotheses had not been explicitly formulated were also investigated. The variables are land tenure status, size of farm, and years of schooling completed. These findings are:

1. Land tenure status and labour productivity were found to be positively and

significantly related among the sample of farmers drawn from the more isolated community, but they were not related in the other community. In other words, in one of the communities owner-operator farmers were more productive than tenant farmers, but in the other community ownership status appeared to have no effect on labour productivity.

The first part of this finding supports the conventional belief that tenancy system operates as a disincentive to agricultural development. However, the second part of the finding suggests that, in certain settings, the labour productivity of peasant farmers is independent of their land ownership status. This would seem to indicate that either community-related factors or the individual characteristics of the farmers, and possibly both sets of factors, interact with land tenure status in determining labour productivity. But the evidence in this study makes the individual-related factor the more logical interpretation.

One of the possible individual-related factors might be committment to farming as a life-time career. In the more isolated community over 65 per cent of the farmers indicated that they would encourage their sons to choose farming as a career. This is interpreted to mean that these farmers view farming as a worthwhile occupation, capable of satisfying their aspirations. On the other hand, less than one-third of the sample of farmers from the less isolated community (32 per cent) indicated that they would encourage their sons to be farmers. And even those farmers favouring that choice qualified their answers with comments such as, 'if they don't have the education for anything else'.

2. No statistically significant relationship was found between labour productivity and size of farm. This is a surprising finding in view of the results

of several other studies[4] which established a positive relationship between those variables. Nevertheless, the noncorrelation might mean that productivity is affected by farm size only if the holdings are of a certain size. If the holdings are below that size the principle of 'diminishing returns' will operate. In other words, if farmers combine more than a certain number of man-hours with a fixed amount of land, average productivity tends to decrease or remain constant. Although this explanation seems plausible for the populations sampled its acceptance requires further investigation.

3. Finally, labour productivity and number of years of schooling were found to be positively and significantly related; but the relationship was specified. When the samples were stratified by community and by category of farmer the correlation (.46) was statistically significant (p .02) only among part-time farmers in Community B. This finding seems to suggest that education interacts with some other characteristic of part-time farmers, possible extent of awareness of market conditions, to influence labour productivity. But the evidence is inconclusive since it was based on a small sample of part-time farmers.

Theoretical Implications of the Study

The above findings seem to suggest that the theory of achievement motivation does not explain differences in economic behaviour among all categories of workers, nor in all settings. It is possible that, in the case of peasant

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[4] B. Goldstein and R. Eichhorn, op. cit.; Anderson and Eichhorn, op. cit.

farmers, need-achievement increases productivity only when that variable is combined with other types of variables such as, the amount of land owned and availability of markets. Indeed, some critics of the motivational theory of economic behaviour among peasant farmers express the view that the theory tends to ignore the importance of structural factors like those mentioned above, and over-emphasizes the value-attitudes of farmers. Galjart,[5] for example, argues that labour productivity of farmers in developing countries, such as those in Latin America, is affected by values and attitudes only after structural impediments of production have been removed.

Some of the evidence in this study provides support for the structural argument. The correlations between labour productivity and perceived demand for farm products were statistically significant in each of the two communities studied. This seems to imply that, in some environments, the behaviour related to agricultural development is, in part, a function of collective institutional arrangements, such as marketing facilities. But the relatively small amount of variation in productivity accounted for by perceived demand for farm products also suggests that no single factor provides sufficient explanation for the level of productivity among farmers. Farmers may know that a market exists for all they can produce, and may be willing to work hard, and yet may not succeed in increasing productivity beyond a certain level unless those conditions are accompanied by other factors, such as a farm of a certain size and security of tenure.

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[5]Benno Galjart, "Rural Development and Sociological Concepts: A Critique," Rural Sociology, 36, (March 1971), pp. 31-41.

While perception of demand was significantly related to productivity among farmers from the two communities in the present study, the relationship was stronger in the community where there were more owner-operator farmers. Furthermore, the relationship was strongest among those part-time farmers whose holdings were larger than the average holding found in both communities. These findings are not definitive since they are based on a relatively small sample of part-time farmers; but they suggest more specific hypotheses for further investigation.

One version of the psychological thesis of economic development argues that, in underdeveloped countries, a major hindrance to increased productivity is the farmers' unwillingness to accept and practice modern techniques of farming. Underlying these assertions, is the usual assumption that both attitudes toward agricultural innovations and the adoption of those innovations are consequences of level of achievement motivation.[6] Inasmuch as attitudes toward farm innovations were found to be positively and significantly correlated with achievement motivation one can conclude that the variables are related in the populations sampled. In other words, the higher the need-achievement of the farmers, the more likely they were to express willingness to adopt new methods of farming. But the fact that the correlations are generally low, suggests that the farmers' attitudes toward agricultural innovations are being affected by other factors as well.

Indeed, the evidence indicates that the predictive value of health status

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[6] Ibid., p. 33.

is equivalent to that of achievement motivation in one community and is a much better predictor of the farmers' readiness to accept farm innovations in the other community. This might mean that both attitudes toward farm innovations and achievement motivation are being influenced by a common factor - the farmers' health status. In the community with the higher number of illnesses the relationship between innovative proneness and achievement motivation is not significant, when the influence of health status is eliminated. On the other hand, the relationship between health status and innovative proneness is highly significant ($p < .01$) in the community with the higher health status after the influence of achievement motivation was held constant.

If these findings represent the actual conditions which exist among peasant farmers in the populations sampled, they suggest that it may be necessary to revise the psychodynamic model of economic behaviour and productivity currently applied to developing countries. When this model is used to explain orientations, attitudes, and behaviour in different settings it tends to ignore the principle of equifinality in social causation.[7] The model also tends to ignore variations in the objective situations in which the actors operate. This study does not permit any empirical generalization to developing countries as a whole or even to the universe of peasant farmers in Jamaica. Nevertheless, health status has been identified as one of the variables which may influence attitudes toward farm innovations and other psychological attributes said to be related to the low level of productivity among peasant farmers.

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[7] Walter Buckley, Sociology and Modern Systems Theory (Toronto: Prentice-Hall of Canada, 1967), p. 60.

On the basis of attitude - innovation theories and studies, as well as the innovativeness scores obtained by the farmers studied, one would expect the adoption of farm practices to be widespread among the farmers. There is no evidence however, that either predisposition toward the adoption of farm practices or achievement motivation by itself is related to actual behaviour. This discrepancy between psychological attributes and behaviour can be interpreted in several ways. Firstly, the absence of statistically significant correlation between the variables may mean that they are not related in the populations sampled. Secondly, in view of the inconsistent findings reported by other studies which have used techniques similar to those of the present study, the noncorrelation between farm adoption practices and attitudinal variables may mean that the latter measures lack validity. It is possible that the respondents' replies were aimed at securing tangible benefits that they might have thought could result from a certain pattern of responses. In fact, the investigator found it impossible to convince a large number of the respondents that the study was a private enterprise not supported by the local government.

A further theoretical implication of the observed noncorrelation between the farmers' expressed need-achievement and their farm adoption practices is that need-achievement may lead to innovativeness only when other conditions are present. The data suggest the following combination of factors: health status, perception of demand for farm products and the farmer's career pattern. For example, although the correlations were low, health status was found to be positively and significantly related to number of farm practices adopted. On the other hand, while neither achievement motivation nor perceived demand by

itself was related to the adoption of farm practices, when those variables were simultaneously controlled the size of the correlation between health status and number of farm practices decreased among part-time farmers. Furthermore, the resulting partial correlations are not statistically significant at the selected level of probability.

These results seem to suggest that even if farmers desire to improve their level of living they may display actions inconsistent with that desire. The discrepancy may be due to the real or perceived absence of adequate incentives which combine with desire to determine behaviour. In other words, achievement motivated farmers are more likely to adopt farm innovations when they believe that there is a market for the products they can produce. The findings from other empirical studies[8] support this inference; but they also suggest that the size of the "payoff" expected by farmers has an even greater effect on their adoption of farm innovations. In Galjart's view adoption-diffusion theories too frequently assume that every innovation is profitable and deserves to be adopted.[9] But in the view of a few researchers, in regions where farmers are accustomed to large fluctuations in crop yields, the financial return expected from the adoption of an innovation would have to be at least 25 to 30 per cent higher than the return obtained from existing practices to make that innovation

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[8] John C. de Wilde, et. al., Experiences with Agricultural Development in Tropical Africa, Vol. I: The Synthesis, (Baltimore, Maryland: John Hopkins Press, 1967).

[9] Galjart, op. cit., p. 37.

profitable,[10] and one may add, rational. Where farm earnings are as low as those reported for the communities studies, and where there are no collectively sponsored programmes which give the farmers in general access to fertilizers and credit, the inability to purchase innovations might be a greater impediment to innovativeness than the farmers' level of achievement motivation.

The farmer's health status is another variable usually ignored by theoretical models which seek to explain economic behaviour and agricultural development in peasant economies. However, on the basis of the findings in this study one can conclude that, for the populations sampled, farmers in good health are less likely to rely on traditional and ineffective methods of farming than farmers inflicted by a large number of physical disabilities. This can be interpreted to mean that ill-health reduces mental alertness and makes the farmer less able to recognize and learn more efficient ways of organizing his activities. Conversely, good health generates a positive orientation toward the future or what John Morse terms 'enlightened self-interest',[11] and this is likely to stimulate innovativeness and rational decision-making. Thus, our finding and its interpretation tend to support those theories of agricultural development which postulate that personal health is one of the variables which conditions both attitudes and behaviour.

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[10] Rogers, Modernization Among Peasant Farmers, loc. cit., p. 313.

[11] John W. Morse, "Demography, Feedback, and Decision-making for Economic and Social Development," Milbank Memorial Fund Quarterly, 42, April, 1964), pp. 309-310.

This perspective does not deny that socio-psychological factors influence the behaviour of peasant farmers or any other category of workers. It suggests, instead, a means which may be more economical than the slow processes of socialization and resocialization usually recommended for changing attitudes and values among peasants. According to one estimate,[12] between 150 and 700 years would be required to change traditional attitudes and practices of people in the developing countries if those changes are mainly a function of early childhood socialization.

Although health status is the best predictor of innovativeness, among the variables investigated in this study, its effect is specified. In the less isolated community which is also the community with a significantly higher percentage of healthy farmers, health status is insignificantly related to adoption of farm innovations. This could mean that either community-related factors or the individual characteristics of farmers, and possibly both sets of factors, interact with health status in determining adoption of farm innovations. One structural factor suggested by the data is related to the normative structure of the communities in which the farmers live. As shown elsewhere, farmers in the more isolated community seem to share the belief that farming is a worthwhile occupation capable of satisfying their aspirations. In the less isolated community farmers place a greater value on non-farm occupations. Thus, it would appear that the value placed on farming by the group as a whole combines with personal health

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[12]Robert L. Burgess and Don Bussell, Jr., Behavioral Sociology: The Experimental Analysis of Social Process, (New York: Columbia University Press, 1969), p. 339.

to influence the practice of farm innovations.

Theory and research evidence also suggest that community differences concerning the value placed on group conformity and the extent of social interaction among farmers are important variables in the acceptance and practice of new ideas. For example, Ramsey and his associates[13] found that in the southwestern part of New York State farmers who valued group conformity got their ideas about farming and other aspects of behaviour from their neighbours and friends. There was also a tendency for the farmers' actions to conform to the prevailing ideas reflected in those groups. Somewhat similar findings were reported by Marsh and Coleman,[14] but their interpretation stressed the influence of interpersonal relationships among farmers such as, frequency with which farmers discuss farm matters with one another and work-exchange relationships.

There was no direct test in this study of the group conformity-interaction explanation of community differences in farm adoption practices. However, the data on patterns of decision-making concerning farm matters suggest that both variables might explain the observed differential effect which personal health exercises on farmers in the two communities studied. As reported elsewhere, farmers in the more isolated community were more likely to make farm decisions in consultation with other farmers than farmers from the less isolated community.

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[13]Charles E. Ramsey, et. al., "Values and the Adoption of Practices," Rural Sociology, 24, (March 1959), pp. 35-47.

[14]C.P. Marsh and A.L. Coleman, "The Relation of Kinship, Exchanging Work and Visiting to the Adoption of Recommended Farm Practices, Rural Sociology, 19 (1954), p. 291-93.

In this community the pattern of decision-making tended to be individualistic i.e. the farmers were less likely to consult with other farmers before making decisions relating to farm matters. These differences in patterns of decision-making also imply that farmers in the more isolated community interact with one another more frequently than farmers in the other community. Furthermore, in the light of theory and some research, it is logical to expect that conformity to group norms will be greater among farmers who interact frequently than among farmers who interact with one another less frequently.

Practical Implications of the Study

While the findings and their interpretation cannot be generalized beyond the populations sampled, they seem to suggest a number of implications for agricultural policy at the village level. Firstly, if innovative proneness is a prerequisite for rational economic behaviour, and consequently for increasing productivity, our data suggest that it may be possible to generate innovativeness among peasant farmers by improving their level of health. There are undoubtedly other ways, such as early socialization, as suggested by some theorists.[15] However, in terms of what some applied scientists term accessibility to manipulation, improving the farmers' state of health might be a more effective and economic way of inducing positive attitudes toward farm innovations. To

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[15] David McClelland, "A psychological Approach to Economic Development," in Economic Development and Cultural Change, (April 1964), pp. 320-324; Bernard Rosen, "Socialization and Achievement Motivation," American Sociological Review, 27, (October 1962), pp. 612-624.

provide a valid basis for the type of action suggested by the theory, an experimental health care programme could be introduced into one or more rural communities known to have farmers with generally poor health. The attitudes toward, and practice of, farm innovations could be assessed before and after the introduction of such a project.[16]

Secondly, the evidence suggests that agricultural development requires a multi-dimensional type of policy. Besides attempting to improve the level of personal health of farmers, it would provide information about the structure of market demand for farm products and about the appropriate use of recommended farm innovations. Since the level of formal education is generally low, these and other types of information about agriculture and marketing may be economically transmitted to farmers by means of radio programmes. These programmes would probably cost the public less than the cost of training a corps of agricultural extension agents to transmit the same information. Of course, it may be necessary also to supplement the radio information technique with some instruction from extension officers. In which case, they could be used for field demonstration projects in, say, the correct use of fertilizers and other methods of soil conservation.

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[16] A somewhat similar proposition is made by Rogers on the basis of his observations of Colombian peasant farmers. See E. Rogers, Modernization Among Peasant Farmers, loc. cit., p. 366.

Suggestions for Future Research

Some of the findings of the present study are suggestive of other factors which might be influencing productivity among peasant farmers. But until they have been further investigated, using larger samples and clearly formulated hypotheses, no firm conclusions can be drawn about their effect.

One of these factors is the category of farmer i.e. whether the farmer works at farming part-time or full-time. In many instances the correlations between the independent and the dependent variables were substantially higher among part-time farmers than among full-time farmers. However, the number of part-time farmers in each of the samples was not large enough to permit comparisons with full-time farmers. It appears, for example, that age and years of schooling may be related to productivity among part-time farmers, although not among full-time farmers. Further research is therefore necessary to discover if the apparent differences are real.

Another question requiring further investigation is the conditions under which land tenure status influences productivity. This question has special significance for agricultural policy in Jamaica. The current policy, instituted in 1973, is a system of leasehold. It is based on the premise that "by leasing land (instead of owning the land) a farmer could retain the bulk of his money for development on the land."[17] In other words, this policy was introduced with the conviction that a system of leasehold would be a more effective way

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[17] Gleaner Farm Desk, "Leaky on land ownership: If sentiment goes leasehold can lead to increased agricultural production," The Jamaica Weekly Gleaner, North American Edition, Norwich, Conn., (January 1974), p. 28.

of increasing agricultural productivity.

According to the evidence from this study owner-operator farmers in the more isolated community tend to be more productive than tenant farmers in that community. On the other hand, there was no evidence of any difference in labour productivity between the two categories of farmers in the less isolated community. This could mean that the norms surrounding land ownership are different in the two communities. It could mean also that the communities have different orientations toward farming as an occupation. Finally, the different effect of land tenure status on labour productivity among farmers in the two communities might mean that productivity is affected by ownership status only if the holdings are of a certain size.

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APPENDIX A

INTERVIEW SCHEDULES

SOCIO-MEDICAL SURVEY: INTERVIEW SCHEDULE (SUMMER 1973 SURVEY)

Introduction: This is a study about the needs and interests of small farmers. If you have no objection to taking part in the study, I would like you to answer some questions about the kinds of things you have been doing on your farm and the kinds of things you would like to do in future. Your name will not be recorded.

PART I - BACKGROUND INFORMATION

1. Identification No. _____

2. Sex: 1. Male _____ 2. Female _____

3. Age at last birthday:

   1. Under 20 years _____
   2. 20-24 years _____
   3. 25-29 years _____
   4. 30-34 years _____
   5. 35-39 years _____
   6. 40-44 years _____
   7. 45-49 years _____
   8. 50-54 years _____
   9. 55 years and over _____

4. Years of schooling completed:

   1. Less than 1 year _____
   2. 1-3 years _____
   3. 4-5 years _____
   4. 6-7 years _____
   5. 8 years or more _____
   6. Number of years beyond elementary school (specify) _____

5. Occupation:

   1. What is your main job for most of the year? _____
   2. What type of work do you do when you are not farming? _____

   _____

6. Marital status:

1. Married _____ 2. Single _____ 3. Other (specify) _____

7. Do you attend church? 1. Yes _____ 2. No _____

3. Sometimes _____ 4. Regularly _____

PART II - HEALTH QUESTIONNAIRE

(Now I would like you to answer some questions about your health and how you treat your health problems.)

8. When was the last time you visited a doctor?

1. Less than a week ago _____
2. One week to 3 weeks ago _____
3. Four weeks to 6 weeks ago _____
4. Seven weeks to 9 weeks ago _____
5. Three months ago _____
6. Three months to 6 months ago _____
7. Six months to 1 year ago _____
8. Over 1 year ago _____
9. Have never been to a doctor _____

HEALTH STATUS INDEX (HSI)

9. Have you been troubled by any of the following conditions?

Medical Condition	Yes	No	Very Much	Some	Not at all	Time when condition began
Headache						
Backache						
Toothache						
Bronchitis						

Medical Condition	Yes	No	Very Much	Some	Not at all	Time when condition began
High blood pressure						
Heart trouble						
Arthritis						
Stomach ulcer						
Malaria						
Kidney trouble						
Diabetes						
Typhoid fever						
Shortness of breath						
Pain in the chest						
Coughing blood						
Swollen joints						
Bladder trouble						
Boils						
Fainting spells						
Menstrual troubles						
Rashes (spots)						
Low blood (anemia)						
Pneumonia						
Bad blood						
Tuberculosis						
Rheumatism						
Scarlet fever						
Chicken pox						
Pain when passing urine						
Fits						
Paralysis						
Asthma						
Small pox						
Internal bleeding						
Other						

10. Are you being treated for your condition? 1. Yes _____ 2. No _____

11. If yes, which of the following persons or sources provide the treatment?

1. Private doctor _____
2. Hospital (specify name) _____
3. Health clinic _____
4. Home remedies (specify) _____
5. Patent medicines _____
6. Other source(s) _____

12. During the past year (1972), did you have to stay in a hospital for any time?

1. Yes _____ 2. No _____

13. If yes, how long did you stay in hospital?

1. Less than 1 day _____
2. One day _____
3. Two to 3 days _____
4. Four to 5 days _____
5. One week _____
6. Eight to 10 days _____
7. Eleven days to 2 weeks _____
8. More than 2 weeks (specify) _____
9. Other (specify) _____

14. During the past year (1972) did you have to stay at home for any time because of illness?

1. Yes _____ 2. No _____

15. If yes, how long did you remain at home because of illness?

1. Less than 1 day _____
2. One day _____
3. Two to 3 days _____
4. Four to 5 days _____
5. One week _____
6. Eight to 10 days _____
7. Eleven days to 2 weeks _____
8. More than 2 weeks (specify) _____
9. Other (specify) _____

16. If you did not have to stay in the hospital, what would you be doing during the days?

1. Work on the farm _____
2. Work around the house _____
3. Other type of work _____
4. No work _____
5. Other type of activity _____

17. What is the size of your farm?

1. Less than ½ an acre _____
2. Half acre to 1 acre _____
3. One to 2 acres _____
4. Two to 3 acres _____
5. Four acres _____
6. Five acres _____
7. More than 5 acres (specify) _____
8. Other _____

18. Which of the following crops do you grow?

1. Bananas _____
2. Sugar cane _____
3. Corn _____
4. Citrus (oranges, grapefruit) _____
5. Cassava _____
6. Vegetables (cabbage, tomatoes, etc.) _____
7. Yams _____
8. Other (specify) _____

19. Which of the above crops are grown for sale? _____

20. During the past year (1972), roughly how much money did you earn from the sale of crops?

1. Bananas $ _____
2. Sugar cane $ _____
3. Corn $ _____
4. Citrus $ _____
5. Yams $ _____
6. Other crops (specify) $ _____
7. Not stated $ _____
8. Don't know _____

21. Do you keep a record of any of the following activities?

1. Sales: Yes _____ No _____ Sometimes _____

2. Expenditure on farm equipment: Yes _____ No _____

Sometimes _____

22. Roughly how much did you spend on the following farm items during 1972?

1. Fertilizers $ _____
2. New seeds $ _____
3. Hired labour $ _____
4. Feeds $ _____
5. Other items (specify) _____ $ _____
6. Not stated _____
7. Don't know _____

23. During the past year (1972), which of the following practices did you use on your farm?

1. Use of fertilizers _____
2. Use of pesticides _____
3. New strains of corn _____
4. Action taken to prevent soil erosion _____
5. Other practice _____
6. None of the above _____

24. In calculating your expenses for the farm, do you estimate the money value of your own labour?

1. Yes _____ 2. No _____ 3. Sometimes _____
4. Hardly ever _____

25. If yes, how much do you think your own labour is worth? _____

26. Do you own/rent the land on which you farm?

1. Own _____ 2. Rent _____ 3. Other _____

27. During 1972 did you raise any of the following animals? Yes ____ No ____

1. Pigs _____ 2. Chickens _____ 3. Cows _____
4. Goats _____ 5. Other animals _____
6. Not stated _____ 7. Don't know _____

28. How much money did you earn from the sale of livestock during 1972?

1. Pigs $ _____
2. Chickens $ _____
3. Cows $ _____
4. Goats $ _____
5. Other animals (specify) $ _____
6. Not stated _____
7. Don't know _____

PART III - ACHIEVEMENT MOTIVATION SCALE

(I would like you to complete the following sentences):

29. For a better life on my farm, I need _____
30. I wish that my eldest son _____
31. In the next 10 years, I'm going to _____
32. My greatest aspiration in life is _____
33. The thing most necessary for my farm is _____
34. Today, to have success in farming one _____
35. Farmers in this country need _____
36. A good farmer must have _____
37. To earn a good return from farming, a farmer must have _____
38. If my work did not progress, I _____

PART IV - INNOVATIVENESS SCALE

39. Do you want to learn new ways to farm?

1. Yes _____ 2. No _____ 3. Undecided _____

40. If an agricultural officer gave a talk would you attend?

1. Yes _____ 2. No _____ 3. Undecided _____

41. If your government would help you to establish a 10-acre farm elsewhere, would you move?

1. Yes _____ 2. No _____ 3. Undecided _____

42. Would you like to own land?

1. Yes _____ 2. No _____ 3. Undecided _____

43. A man can usually better himself by hard work.

1. Agree _____ 2. Disagree _____ 3. Undecided _____

44. Do you think it is wise to borrow money?

1. Yes _____ 2. No _____ 3. Undecided _____

45. Do you want to change your way of life?

1. Yes _____ 2. No _____ 3. Undecided _____

46. Do you think you will change your way of life in the future?

1. Yes _____ 2. No _____ 3. Undecided _____

47. A farmer should try to farm the way his parents did.

1. Yes _____ 2. No _____ 3. Undecided _____

48. Do you want your sons to be farmers?

1. Yes _____ 2. No _____ 3. Undecided _____

49. It is better to enjoy today and let tomorrow take care of itself.

1. Yes _____ 2. No _____ 3. Undecided _____

50. A man's fortune is in the hands of God.

1. Agree _____ 2. Disagree _____ 3. Undecided _____

PART V

51. During the past year (1972), how many times did you visit Montego Bay?

1. Once _____ 4. Between 4 and 5 times _____
2. Twice _____ 5. More than 6 times _____
3. Three times _____ 6. Other (specify) _____

52. During the past year (1972), how many times did you visit Lucea?

1. Once _____ 4. Four to 5 times _____
2. Twice _____ 5. More than 6 times _____
3. Three times _____ 6. Other (specify) _____

53. Are you a financial member of any farming body?

1. Yes _____ 2. No _____

54. If yes, are you a member of any of these?

1. Jamaica Agricultural Society/National Farmers' Union _____
2. Cane Farmers' Association _____
3. Citrus Growers' Association _____
4. Pig Farmers' Association _____
5. Other (specify) _____

55. How many times did you attend the local branch meetings during 1972?

1. Once _____ 4. Four to 5 times _____
2. Twice _____ 5. Six to 7 times _____
3. Three times _____ 6. More than 7 times (specify) _____

56. From which of the following sources did you obtain farm information during the year?

1. J.A.S./N.F.U. _____ 2. C.F.U. _____ 3. C.G.A. ____
4. P.F.A. _____ 5. P.R.A. _____ 6. Other source (specify) ____
7. Sought no information _____

57. If a farmer wants to increase the size of his holding, can he get land to buy?

1. Yes _____ 2. No _____ 3. Don't know _____

58. If a farmer wants to increase the size of his holding, can he get land to rent?

1. Yes _____ 2. No _____ 3. Don't know _____

59. From whom would he buy or rent? _____

60. While you were growing up, was your father present in the home?

1. Present _____ 2. Absent _____ 3. Don't remember _____

61. If the answer to Question 60 is 'no', why was your father absent?

1. Deceased _____ 3. Divorced _____

2. Separated _____ 4. Other (specify) _____

62. How large is your family? _____

63. Who makes the decisions about what is to be done on the farm?

1. Husband _____ 3. Both husband and wife _____

2. Wife _____ 4. Other (specify) _____

64. How many days a week do you devote to farming? _____

65. Roughly how many hours a day do you devote to farming? _____

66. Are there days when you do not work?

1. Yes _____ 2. No _____

67. What are your reasons for not working on those days? _____

_____

_____

APPENDIX B

ILLNESSES AND SYMPTOMS REPORTED

TABLE I - B

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SPECIFIC ILLNESSES, ILLNESSES REPORTED AND COMMUNITY (MULTIPLE ILLNESSES)

Illness Conditions	Community A Per Cent	Community B Per Cent
Arthritis and Rheumatism	35.0	24.0
Asthma	2.0	1.0
Bad blood	3.0	3.0
Boils	42.0	44.0
Bladder trouble	5.0	1.0
Bronchitis	6.0	6.0
Common cold	11.0	10.0
Dental caries	51.0	39.0
Diabetes	2.0	5.0
Eye problem	5.0	4.0
Hernia	1.0	1.0
Heart trouble	10.0	3.0
High blood pressure	19.0	9.0
Injury	9.0	10.0
Low blood pressure	-	3.0
Malaria	5.0	-
Nervous breakdown	2.0	1.0
Pneumonia	-	1.0
Paralysis	3.0	-
Scarlet fever	2.0	-
Small pox	1.0	-
Skin rashes	35.0	30.0
Stomach ulcer	14.0	11.0
Tuberculosis	2.0	-
Typhoid fever	1.9	-
Venereal disease	-	1.0
Number of persons reporting	103	80

TABLE II - B

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SYMPTOMS REPORTED AND BY COMMUNITY

Reported Symptoms	Community A Per Cent	Community B Per Cent
Backache	67.0	65.0
Biliousness	3.0	4.0
Coughing up blood	1.0	1.0
Fainting spells	26.0	15.0
Headache	63.0	54.0
Internal bleeding	2.0	-
Nerves	12.0	6.0
Pain when passing urine	9.0	3.0
Pain in the chest	32.0	30.0
Persistent tiredness	35.0	34.0
Shortness of breath	23.0	20.0
Sleeplessness	3.0	1.0
Swollen joints	25.0	16.0
Weight loss	-	1.0
Number of persons reporting	103	80

TABLE III - B

ITEM-TO-TOTAL SCORE CORRELATIONS FOR THE HEALTH STATUS INDEX

Index Items	Community A	Community B
Headache	.57	.46
Backache	.52	.61
Toothache	.21	.48
Bronchitis	.37	.33
High blood pressure	.50	.33
Heart trouble	.40	.16
Arthritis	.59	.63
Stomach ulcer	.29	.33
Malaria	.26	.20
Kidney trouble	.20	.16
Diabetes	.20	.21
Typhoid fever	.20	.23
Shortness of breath	.59	.45
Pain in the chest	.54	.54
Coughing up blood	.24	.16
Swollen joints	.60	.38
Bladder trouble	.25	.00
Boils	.38	.41
Fainting spells	.56	.33
Skin rashes	.43	.50
Low blood pressure	.00	.16
Pneumonia	.42	.23
Bad blood	.29	.28
Tuberculosis	.00	.00
Rheumatism	.33	.16
Scarlet fever	.00	.00
Chicken pox	.20	.17
Pain when passing urine	.25	.16
Fits	.00	.00
Paralysis	.14	.00
Asthma	.14	.16
Small pox	.14	.00
Internal bleeding	.20	.00

APPENDIX C

ACHIEVEMENT MOTIVATION SCORES

TABLE III - C

PERCENTAGE DISTRIBUTION OF FARMERS BY ACHIEVEMENT MOTIVATION SCORES AND BY COMMUNITY

Achievement Motivation Scores	Community A Per Cent	Community B Per Cent
0 - 5	-	1.0
6 - 10	19.0	18.0
11 - 15	59.0	50.0
16 - 20	20.0	29.0
21 - 25	2.0	3.0
26 - 30	-	-
31 - 40	-	-
Total	100.0	101.0
N	(103)	(80)
Mean	14.0	14.0
Median	14.0	14.0

APPENDIX D

SCORES ON ATTITUDES TOWARD FARM INNOVATIONS

TABLE IV - D

PERCENTAGE DISTRIBUTION OF FARMERS BY INNOVATIVE PRONENESS AND BY COMMUNITY

Innovative Proneness Scores	Community A	Community B
0 - 14	-	1.0
15 - 20	2.0	3.0
21 - 25	13.0	5.0
26 - 30	54.0	28.0
31 - 36	31.0	64.0
37 - 40	-	-
Total	100.0	101.0
N	(103)	(80)
Mean	29.0	30.0
Median	30.0	32.0

APPENDIX E

ADDITIONAL DATA ON PATTERNS OF FARMING

TABLE V - E

DISTRIBUTION OF FARMERS BY REPORTED NUMBER OF DAYS PER WEEK DEVOTED TO FARM WORK AND BY COMMUNITY

Reported Number of Days	Community A Per Cent	Community B Per Cent
Less than 3 days	4.0	10.0
3 days	13.0	5.0
4 days	21.0	24.0
5 days	16.0	20.0
6 days	47.0	41.0
Total	101.0	100.0
N	(103)	(80)
Mean	5.0	5.0
Median	5.0	5.0

TABLE VI - E

DISTRIBUTION OF FARMERS BY FARM PRACTICES REPORTED AND BY COMMUNITY

Reported Farm Practices	Community A Per Cent	Community B Per Cent
Action taken to prevent soil erosion	22.0	29.0
Estimated money value of own labour	15.0	9.0
Kept record of farm expenditure	10.0	13.0
Kept record of sales	16.0	11.0
Planted new strains of corn	6.0	3.0
Used fertilizers	18.0	9.0
Used pesticides	12.0	10.0
N	(103)	(80)

TABLE VII - E

DISTRIBUTION OF FARMERS BY REPORTED EARNINGS FROM THE SALE OF CROPS AND BY COMMUNITY

Earnings from the Sale of Crops	Community A Per Cent	Community B Per Cent
None	14.0	16.0
Under J$100.00	23.0	20.0
$100.00 - 199.00	17.0	21.0
200.00 - 399.00	15.0	13.0
400.00 - 599.00	6.0	5.0
600.00 - 799.00	3.0	1.0
800.00 - 999.00	1.0	1.0
1000.00 - 1999.00	1.0	3.0
2000.00 and over	-	3.0
Not stated	21.0	18.0
Total	101.0	101.0
N	(103)	(80)

TABLE VIII - E

DISTRIBUTION OF FARMERS BY REPORTED EARNINGS FROM LIVESTOCK AND BY COMMUNITY

Reported Earnings from Sale of Livestock	Community A Per Cent	Community B Per Cent
None	61.0	74.0
Under J$50.00	8.0	4.0
$50.00 - 99.00	4.0	4.0
100.00 - 199.00	3.0	5.0
200.00 - 299.00	2.0	-
300.00 - 399.00	2.0	1.0
400.00 - 499.00	1.0	1.0
500.00 - 599.00	-	-
600.00 and over	1.0	3.0
Not stated	19.0	9.0
Total	101.0	101.0
N	(103)	(80)

TABLE IX - E

DISTRIBUTION OF FARMERS BY NUMBER OF FARM MEETINGS ATTENDED IN 1972 AND BY COMMUNITY

Number of farm meetings attended	Community A Per Cent	Community B Per Cent
None	58.0	60.0
1 - 2	14.0	24.0
3	9.0	10.0
4 - 5	5.0	3.0
6 - 7	12.0	3.0
8 or more	3.0	1.0
Total	101.0	101.0
N	(103)	(80)
Mean	6.0	5.0

VITA

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YEAR OF BIRTH: 1930

POST-SECONDARY EDUCATION AND DEGREES:

Mico Training College
Kingston, Jamaica
1954 - 1955 Teacher's Certificate

University of Manitoba
Winnipeg, Manitoba
1960

University College of the West Indies
Mona, Jamaica
1960 - 1963 B.Sc. (Economics) (London)

University of Manitoba
Winnipeg, Manitoba
1965 - 1967 M.A.

University of Alberta
Edmonton, Alberta
1968 - 1971

HONOURS AND AWARDS:

Jamaica Government Bursary
University College of the West Indies
1960 - 1963

Teaching Assistantship
University of Manitoba
1965 - 1966

National Department of Health and Welfare Grant
University of Manitoba
1966 - 1967

Graduate Teaching Assistantship
University of Alberta
1968 - 1971

RELATED WORK EXPERIENCE:

Statistical Officer
Department of Housing
Kingston, Jamaica
1963 - 1964

Administrative Officer II
Ministry of Communications and Works
Kingston, Jamaica
1964 - 1965

Teaching Assistant
University of Manitoba
1965 - 1966

Instructor, Evening Summer School
University of Manitoba
1967

Lecturer
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University of Manitoba
1967 - 1968

Instructor, Summer Session
The Department of Sociology
University of Manitoba
1968

Graduate Teaching Assistant
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1968 - 1971

Lecturer
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1971 - 1975

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"Preliminary Report on the Adoption of Television by Native Communities in the Canadian North: A Comparative Study." Co-author with J. Hamer and E. Monu.